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ABSTRACT

Charged with the responsibility of determining the best way to plan for solar technology information transfer within the state of Texas, participants in the Planning Conference for Solar Technology Information Transfer met to discuss the many ongoing activities related to energy information dissemination, to analyze the resources available in Texas for both the development of solar technology and for its transfer, and to make recommendations for further action. They resolved (1) that a citizens' subcommittee study the feasibility of planning and implementing a closely coordinated energy information dissemination system which would utilize all available resources, especially public libraries; (2) that this subcommittee include a representative from the Texas State Library, and (3) that the League of Women Voters be informed of the conference resolutions and asked to submit them to the Texas Energy Advisory Council. The creation of an energy information center specific to the needs of all Texans was also urged. Appendices to the report include brochures and pamphlets which concern the transfer of solar energy information. (FM)

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REPORT OF A PLANNING CONFERENCE

FOR SOLAR TECHNOLOGY INFORMATION TRANSFER

AUSTIN TEXAS 12-13 JUNE 1979

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SOUTHERN SOLAR ENERGY CENTER

SOUTHWESTERN LIBRARY ASSOCIATION

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JOHNNIE GIVENS, CONFERENCE DIRECTOR

ANN BOWDEN, RECORDER AND EDITOR

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THIS REPORT WAS PREPARED WITH THE SUPPORT OF THE U.S. DEPARTMENT OF ENERGY (DoE) AND THE SOUTHERN SOLAR ENERGY CENTER (SSEC). HOWEVER, ANY OPINIONS, FINDINGS, CONCLUSIONS, OR RECOMMENDATIONS EXPRESSED HEREIN ARE THOSE OF THE AUTHOR AND DO NOT NECESSARILY REFLECT THE VIEWS OF DoE OR SSEC.

BE IT RESOLVED, THAT A SUBCOMMITTEE OF THE CITIZENS' ADVISORY COMMITTEE OF THE TEXAS ENERGY AND NATURAL RESOURCES ADVISORY COUNCIL STUDY THE FEASIBILITY OF PLANNING AND IMPLEMENTING A CLOSELY COORDINATED ENERGY INFORMATION TRANSFER SYSTEM WHICH WOULD UTILIZE EXISTING INFORMATION NETWORKS, CURRENT TECHNOLOGIES, SOPHISTICATED BIBLIOGRAPHICAL CONTROL AND AN INFORMATION CLEARING HOUSE TO BETTER INFORM ALL TEXANS IN NEED OF ENERGY INFORMATION THROUGH A COMPREHENSIVE PROGRAM FOR PUBLIC AWARENESS.

Thus resolved some twenty Texans* after two days, 12-13 June 1979, of meeting in Austin, Texas, charged with the responsibility of determining the best way to plan for solar technology information transfer within the State of Texas. Officially termed A Planning Conference for Solar Technology Information Transfer, the Conference was the culmination of many months of planning at the state and national level. In fact, the Texas Planning Conference followed earlier Planning Conferences held in Georgia, Kentucky, Louisiana, Mississippi, South Carolina, Tennessee, Virginia, and West Virginia.

The Planning Conference in Texas resulted from a U.S. Department of Energy Grant[1] which established the Solar Technology Transfer Program

> to provide the citizen through transfer agents, state of the art information on the technologies available in solar energy. The program is based on the premise that a viable commercial market and an informed citizenry are interdependent.[2]

The citizens of Texas are, and will continue to be, the beneficiaries of a program sponsored by the Southeastern Library Association, the Southern Solar Energy Center and the Southwestern Library Association with the Assistance of the Texas Governor's Office on Energy Resources and the Texas State Library.

First evidence of the activities of the Texas project was the mailing to all public libraries in the state of a brochure[3] announcing a series of sixteen Solar Energy Workshops which were to be held between 14 May and 6 June in the cities of Abilene, Amarillo, Arlington, Austin, Corpus Christi, Diboll, El Paso, Lubbock, McAllen, McKinney, Odessa, Pasadena, San Antonio, Tyler, Waco, and Wichita Falls. The Workshop brochure announcement, Wake Up to the Sun, introduced librarians to the project "designed to provide information and materials through public libraries to builders, architects, homeowners, the business community and the general public."[4] And the information and material promised in the brochure was not long in coming, for all public libraries soon received a slick pamphlet box labelled "SOLAR ENERGY" with more than sixty items

pertaining directly to solar energy information: articles, booklets, and bibliographies, produced by government agencies as well as private organizations, and all giving the latest advice or access to advice available today. The Solar Energy Workshops were designed to introduce this material to reference librarians and to "discuss methods of answering or referring patrons' questions about solar energy."[5]

The planning required by the Southern Solar Energy Center as listed in Subcontract "Statement of Work for Phase II of the Solar Technology Transfer Program"[6] specified seven basic steps for fulfilment of the obligations assumed by the parties to the contract: initial offer of program, initial overall planning, kits of basic solar technology information, collections of advanced technical materials, workshops, two-day planning conferences, and a final report. The commitment for collections of advanced technical materials was met in Texas through the deposit of supplementary collections at the public libraries in Dallas, El Paso, Houston, and San Antonio. The Austin Public Library has also chosen to add the sixty-eight advanced technical titles, thus assuring even wider distribution on a statewide basis.

Thus the groundwork (the planning, the kits and the advanced technical collections) was well laid when the Southeastern Library Association representative, Eileen M. Janas, Assistant for the Solar Technology Transfer Program, arrived for her first workshop on 14 May in San Antonio. During the following three-and-one-half weeks she criss-crossed the state sharing her expertise with hundreds of librarians, and most of all impressing upon all the availability of assistance from governmental and private sources, should the material provided by the

workshops prove inadequate for citizens' needs.

This then is a summary of the activity in the five months preceding the Planning Conference for Solar Technology Information Transfer in Austin.

* * * * * *

The Southern Solar Energy Center Statement of Work clearly describes element 6 and its role as an integral part of the program as

> A two day conference . . . used as a planning device so that representatives from government planning agencies, consumers services, libraries and other information agencies dealing with energy can communicate, identify solar energy information needs and develop a plan particular to the state which can be implemented for reaching those needs.[7]

The letter of invitation sent from Tucker, Georgia, to approximately thirty chosen participants made it clear at the start that every attempt was being made to follow these guidelines:

> Decision makers will analyze the information facilities of Texas, . . .
>
> You will be joining representatives from the State Energy Offices, the State Planning Office, the Consumer Protection Agency, the Office of the Commissioners of Higher Education and Occupational Education and Technology, the Central Education Agency, Solar Energy and Library Associations, and the Texas State Library Agency in a seldom experienced inter-agency planning experience.[8]

And as participants gathered on a bright morning in June, the sense was one of expectation at the prospect of a "seldom experienced inter-agency experience," for during the progress of the conference as many as sixteen private and governmental, sponsor and non-sponsor, Texan and non-Texan agencies were involved in conversations around the table. Two main groupings quickly appeared to predominate, the Texas State agencies and the library entities, with the consumer representation from the League of Women Voters and the Texas Solar Energy Society forming a vocal minority.

It was apparent to all immediately that the timing for this Texas Planning Conference was auspicious from many aspects. First, it seems that Texas will have the distinction of having the last of the state planning conferences organized under the aegis of the Southeastern Library Association working with state and local librarians. Texas itself is entering a new period of political development quite apart from any previous era, with the election of a Republican governor for the first time in more than one hundred years and the passage of Senate Bill No. 921 creating the Texas Energy and Natural Resources Advisory Council. It is the latter action which promises to provide the greatest promise for effective coordination of solar technology information transfer. The significance of the action is shown by the high official nature of the twenty-one members[9] and by the fact that "the governor and lieutenant governor are cochairmen of the council. The speaker of the house of representatives is vice-chairman."[10]

The State of Texas, as the producer of a lion's share of all energy produced within the United States, has had a wide variety of energy

agencies throughout the years, so that the latest action of the 96th Legislature is a clear attempt to consolidate in one body many related activities. The new Texas Energy and Natural Resources Advisory Council becoming operational on 1 September 1979 will succeed the Texas Energy Advisory Council and the Natural Resources Council and will include the activities of the Governor's Office of Energy Resources. Although the executive director "with the approval of the cochairmen may establish divisions to carry out the functions of the council,"[11] two such divisions are specified in the Bill: the Energy Analysis and Development Division and the Energy Conservation Division. The responsibilities assigned to the Energy Conservation Division give the greatest promise in the area of solar technology information development

> The energy conservation division shall:
>
> provide and develop energy conservation information and policy analysis for the council and others as the cochairmen may direct;
>
> recommend energy conservation policy positions to the council;
>
> recommend legislation to the council to foster energy conservation;
>
> coordinate and support energy conservation related technology, research, development, and demonstration;. . .[12]

This reorganization should coordinate and strengthen efforts such as the "Texas Solar Realities 79" program sponsored by the Governor's Office of Energy Resources which is now presenting nine "low-cost [$25]

down-to-earth workshops for builders, contractors, hvac and plumbing firms, engineers, architects, solar installers, swimming pool contractors, public officials, do-it-yourselfers."[13] The brochures announcing these workshops stated that "there are strong indications that the solar industry is coming of age in Texas and nationwide. Consumers are now aware that the energy crisis will not go away, . . ." and these statements were made before the dramatic worsening of the energy crisis during mid-summer of 1979.

Discussion on the first day of the Planning Conference centered on the many ongoing activities related to sound solar technology information transfer with the most successful clearly being another activity of the Governor's Office of Energy Resources--"The Energy Search Center"--a project of the Texas Energy Conservation Plan funded by the U.S. Department of Energy. This Center utilizes the latest technological advances to access data from on-line data bases such as the New York Times Information Bank, Lockheed Information Systems and the System Development Corporation. Unfortunately, from the average citizen's standpoint, the Center was developed by the Texas Industrial Commission "to save Texas manufacturers money on industrial energy costs"[14] and the convenient 800 number is provided for "all Texas manufacturers, as well as engineering and architectural constultants working with companies building or retrofitting plants in Texas, . . ."[15] It was clear from the expressions of those at the Planning Conference that the Energy Search Center could clearly serve as a model for an energy information transfer center with much broader clientele. As the Energy Search Center's brochure so

aptly states: "Energy conservation information such as this has heretofore been available only through universities and private information sources which charge for both their research time and printouts."[16] As the librarians present hastened to point out, this level of information service is also available from a number of the largest public libraries in the state, usually on a pass-through basis with the library patron, be the patron an individual or a manufacturer, paying for the cost of computer on-line time as well as for any subsequent printouts of bibliographic information.

The availability of information on a long-term, established basis from the libraries of the state, public and private, academic and special, was a fact well known by the majority of the participants, but a few present did not at first recognize libraries as a prime source for information on energy or more specifically on solar energy. Through a process of education as a result of discussion, even the most reluctant participant by the morning of 13 June was ready to acknowledge that the libraries of the State of Texas must play an important role in the dissemination of solar energy information.

Fortunately the libraries of the state are well organized to support the provision of solar technology information transfer, for even the very smallest public library is probably a member of the Texas State Library System, a network of public libraries constituted by Legislative action, which has established ten of the largest public libraries[17] as Major Resource Centers, each assigned the responsibility of utilizing state and federal funds for the enhancement of municipal libraries in their

allotted counties. It is through this structure that the patron of a small library through the state interlibrary loan network has access to information held by the largest library. Bibliographies such as the basic bibliography on solar energy sent to all public libraries in the state provide a starting-point for even the most ill-informed citizen who is interested in the ramifications of solar technology at a personal level.

The Texas State Library at Austin plays a vital role in all aspects of information transfer throughout the state, but is particularly charged with responsibility for the implementation of the Texas State Library System. For example, funding is provided for the interlibrary loan activities of the ten Major Resource Center Libraries through the Texas State Library. The Texas State Library also acts as a leader in directing the development of new services such as its specific support of the OCLC bibliographic network in Texas by providing funds for certain libraries to participate in the various nationwide subsystems. The latest OCLC subsystem supported in this way is the Interlibrary Loan Subsystem which allows for direct online requests for the borrowing of specific titles. Its success is further evidence of the need for bibliographic control and ready access.

The Texas State Library System is similar to other library systems in the state which operate regionally, or by type of library, but all are designed to offer better library/information service through cooperation than any library can offer singly. In the subject area of energy technology, the largest university in the state, the University of Texas at

Austin, is well known for its Center for Energy Studies which offers information to all on current research progress in both active and passive systems. Regrettably all appropriated funding for this Center was vetoed by the Governor from the 1979-81 appropriations bill, a fact which "effectively cuts out all the solar research . . . funded by the center."[18] Another of the many distinguished centers of solar energy research[19] is at Texas A & M University, the Center for Energy & Mineral Resources with an active program of developing energy technology information.

With this type of commitment by higher education in the state, it is not surprising that the Division of Curriculum Development of the Texas Education Agency has developed the Texas Energy Education Framework[20]

> to assist teachers, administrators, and other school personnel in the process of infusing energy education concepts into the public school curriculum. The Framework focuses on the basic concerns and needs of people as related to energy and suggests ways in which energy conservation can become a meaningful part of all disciplines in elementary and secondary schools.
>
> We hope that the Framework will be a useful tool in helping young people become more aware of the critical decisions which we all face in meeting the present and future energy needs of our state and nation.[21]

There is little wonder then that Texans exposed to energy information formally and informally, in school and in the media, should choose to

support an active involvement of state government in energy information development with their tax dollars and also to become members of private groups dedicated to concern/study and decision-making about the energy alternatives available to the State of Texas. The League of Women Voters has for many years actively involved its members in in-depth study of energy problems, with resultant decisions being communicated to governmental bodies capable of effecting change. On an equally committed level the Texas Solar Energy Society publishes a comprehensive newsletter, TX-SES NEWS,[22] for its members.

* * * * * *

The participants in the first Texas Planning Conference for Solar Technology Information Transfer devoted the first day to a thorough analysis of the resources available in Texas both for the development of solar technology and for the transfer of same, and agreed that Texas is well organized and certainly interested in the pursuit of more comprehensive energy information transfer as expressed in the charge to the group:

> The Department of Energy [and SSEC are] concerned with continuing dissemination of solar energy information since the field is a growing one and new information is constantly appearing.[23]

The importance of the Texas meeting from a national perspective was further emphasized for the participants by the presence on both days of representatives from the Southern Energy/Environmental Information Center and from the Southern Solar Energy Center both in Atlanta, Georgia. And the importance on a state level was made clear by the attendance of the Chairman of the Committee on Energy Resources of the Texas House of

Representatives. It was in this atmosphere of the serious nature of the deliberations that the group settled down to make recommendations, all in the light of the Texas energy technology information situation as delineated on Monday 12 June. All present felt that there was a clear need for a more comprehensive way of centralizing energy technology information and of disseminating the information to all who have a need for it. The abundance of state and private groups producing sophisticated energy technology information must continue to develop and to transfer information without recourse to newly established agencies since funding does not exist. Concurrence was achieved that although the Planning Conference was called for specific attention to solar energy information transfer, the needs in Texas called for similar attention to coal, lignite, nuclear, and oil/gas. As a result of basic agreement, the group outlined the major recommendation which introduced this paper, with other pertinent recommendations which complement it:

> Be it resolved, that a subcommittee of the Citizens' Advisory Committee of the Texas Energy and Natural Resources Advisory Council study the feasibility of planning and implementing a closely coordinated energy information transfer system which would utilize existing information networks, current technologies, sophisticated bibliographical control and an information clearing house to better inform all Texans in need of energy information through a comprehensive program for public awareness.

With the establishment of the Texas Energy and Natural Resources Advi-

sory Council, it is sincerely hoped that the Citizens' Advisory Committee which has functioned effectively under the Texas Energy Advisory Council will be continued which will in subcommittee address in depth the need for an energy information transfer system.

The coordination of such a system must take into account the valuable resource which existing library networks provide, with many of the Planning Conference participants suggesting that the Texas State Library, as the official depository for state publications,be developed to an even greater extent, since the activities of an energy clearing house such as the splendid work of the Texas Energy Extension Service of the Governor's Office of Energy Resources must rely upon a comprehensive collection where effective bibliographical control allows for maximum utilization and access. A state energy clearing house could most expeditiously utilize sophisticated telephone communication, with statewide 800 number access and ready capability for transfer to referral agencies. The Texas State Library and/or the clearing house must have current annotated bibliographies in printed form as well as bibliographic access through online and/or COM [Computer on Microfilm] catalogs. Additionally access to the most complete online reference data bases is a necessity in this world of rapidly changing technologies.

It was because of the concern of the group that the expertise of the professional information specialist, the librarian, be utilized, that a second recommendation was made:

> Be it resolved, that the subcommittee of the Citizens' Advisory Committee of the Texas Energy and Natural Resources Advisory Council include a representative from the Texas State Library.

And finally, it was the concern of the Planning Conference participants that the recommendations of the group be acted upon. As practical individuals in search of the most effective spokesperson, the group passed a final recommendation:

> Be it resolved that Laura Keever,of the League of Women Voters, a group known as staunch proponents of energy conservation and of the use of renewable energy resources, be informed of the recommendations of the Texas Planning Conference for Solar Technology Information Transfer and asked to submit these recommendations to the Citizens Advisory Committee of the Texas Energy Advisory Council.

The magnitude of the problem of energy technology information transfer facing Texans may be placed in perspective by the fact that the National Solar Heating and Cooling Information Center receives more than two thousand telephone calls each week. The Planning Conference participants urge an information center which is specific to the needs of all Texans which does not replicate national centers, and which addresses all sources of energy.

F O O T N O T E S

* see Appendix A for list of participants.

1. Department of Energy Grant No. EM-78-G-01-4144. Subcontract No. SSEC-EM-0066.
2. Solar Technology Transfer Program/Guide Manual/State Library Agency. [Tucker, Georgia: Southeastern Library Association, 1978. p. 2]
3. WAKE UP TO THE SUN. [Austin, Texas: Texas State Library, 1979.] see Appendix B.
4. Ibid., col. 1.
5. Ibid.
6. Attachment A to Department of Energy Grant No. EM-78-G-01-4144, Subcontract No. SSEC-EM-0066.
7. Ibid., par. 1.0, 6.
8. Typed form letter signed Eileen M. Janas, Assistant for the Solar Technology Transfer Program, May 1979. 2 pages.
9. Senate Bill No. 921. Texas Legislature, 96th Session. Section 1, (b). "The Council is composed of 21 members. The members are the following officials: the governor, the lieutenant governor, the speaker of the house of representatives, the attorney general, a member of the Railroad Commission of Texas designated by the Railroad Commission of Texas, a member of the Public Utility Commission of Texas designated by the Public Utility Commission of Texas, the chairman of the Texas Air Control Board, the chairman of the Texas Water Development Board, the chairman of the Parks and Wildlife Commission, the

Commissioner of the General Land Office, the Commissioner of agriculture, the comptroller of public accounts, the Director of the Bureau of Economic Geology of The University of Texas at Austin, two senators appointed by the lieutenant governor, two members of the house of representatives appointed by the speaker of the house, and four citizens appointed by the governor."

10. Ibid., Section 1, (c).
11. Ibid., Section 3.
12. Ibid., Section 5.
13. Texas Solar Realities 79. [Austin, Texas:] Governor's Office of Energy Resources, 1979. col. 1. Workshops held 20-21 June, Austin; 1-2 August, Brownsville; 8-9 August, Corpus Christi; 12-13 September, Lubbock; 19-20 September, El Paso; 17-18 October, Houston; 24-25 October, San Antonio; 7-8 November, Dallas, 14-15 November, Fort Worth.
14. The Energy Search Center. Austin, Texas: Energy Utilization Department, Texas Industrial Commission, [1979.] cols. 4-5. see Appendix C.
15. Ibid., col. 4.
16. Ibid., col. 3.
17. Abilene, Amarillo, Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Lubbock, San Antonio. see Appendices D-H.
18. "Clements slashes UT appropriations," Daily Texan 19 June 1979, p. 5.
19. Energy Institute, University of Houston; Center for Energy Research,

Texas Tech University; Center for Energy & Mineral Resources, Texas A & M University; Center for Energy Policy Studies, Energy Extension Service and the Energy Systems Research Center, University of Texas at Arlington; Center for Energy Studies and the LBJ School of Public Affairs, University of Texas at Austin; Center for Energy Studies, University of Texas at Dallas; Solar Data Center, Trinity University.

20. Texas Energy Education Framework. Austin, Texas: Texas Education Agency, 1979. see Appendix I.

21. Ibid., p. [iii.] Foreword by M. L. Brockette, Commissioner of Education.

22. TX-SES NEWS, published quarterly since 1977.

23. Op. cit., note 2.

24. see Appendix J.

Jan Albers
League of Women Voters of Texas

Ann Bowden, Associate Director
Austin Public Library

Mary R. Boyvey, Media Program Dir.
Texas Education Agency

John H. Carlson, Program Coordinator for Commercial and Solar
Governor's Office of Energy Resources

Jane F. Clark, Director
Southern Energy/Environmental Information Center

Lance dePlante, Manager, Energy Utilization Department
Texas Industrial Commission

Charles Galvin Jr.
Texas Energy Advisory Council

Annie May Gilbert, President
Texas Library Association

Johnnie Givens, Executive Dir.
Southeastern Library Assn.

Bill Gooch, Assistant State Lib.
Texas State Library

Dena Gordon, Coordinator
Energy Search Center
Texas Industrial Commission

John M. Gosdin, Coordinator
General Government Sect., State Clearing House
Governor's Budget & Planning Off.

William A. Grusy, Director
Division of Post-Secondary Progs.
Texas Education Agency

Thomas J. Halicki
Public Utilities Commission

Joe C. Hanna, Representative and Chairman, Committee on Energy Resources
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Howard A. Hickman, Committee Counsel
Committee on Energy Resources
Texas House of Representatives

Anne Hollingsworth, Media Consultant
Texas State Library

Jane Howell, Engineering Librarian
The General Libraries
The University of Texas at Austin

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Southeastern Library Association

Mike Levin, Public Information Officer
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Leeta Murphy, Energy Search Center
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Syd Popinsky
Texas State Library

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Information Services Division
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Governor's Office of Energy Resources

Russel E. Smith, Executive Director
Texas Solar Energy Society

Ben Teague, Associate Commissioner for Occupational Education and Technology
Texas Education Agency

Ira Nell Turman, Coordinator for Energy Education
Texas Education Agency

Wake Up to the Sun

SOLAR ENERGY WORKSHOP

Within the next two months, public librarians will begin receiving materials and training on the solar energy information project, Wake Up to the Sun. Sponsored by the Southeastern Library Association, the project is designed to provide information and materials through public libraries to builders, architects, homeowners, the business community and the general public.

All public libraries will receive a box of pamphlets and government documents on solar energy utilization and technology. Publicity materials will also be provided to assist in notifying the public of their availability.

Numerous workshops will be conducted across the state by Eileen Janas, project coordinator. These reference workshops are designed to introduce the project materials and to discuss methods of answering or referring patrons' questions about solar energy. The workshops are scheduled from 9:00 a.m. to 3:00 p.m. in the following locations:

May 14	San Antonio Public Library 203 South St. Mary's San Antonio, Texas 78205
May 15	Pasadena Public Library 1201 Minerva Pasadena, Texas 77506
May 16	Temple Memorial Library, P.O. Box 597 300 Park Street Diboll, Texas 75941
May 17	Greenwood Branch 4044 Greenwood Drive Corpus Christi, Texas 78416
May 18	McAllen Memorial Library 601 North Main McAllen, Texas 78501
May 21	Texas Eastern University, 3900 University Blvd. Tyler, Texas 75701
May 22	McKinney Memorial Library 314 South Chestnut McKinney, Texas 75069
May 23	Arlington Public Library 101 East Abram Arlington, Texas 76010
May 24	Kemp Public Library, 1300 Lamar Street Wichita Falls, Texas 76301
May 25	El Paso Public Library 501 North Oregon El Paso, Texas 79901
May 29	Abilene Public Library 202 Cedar Street Abilene, Texas 79601
May 30	First Baptist Church 709 North Lee Odessa, Texas 79761
June 1	Lubbock City-County Library 1306 Ninth Street Lubbock, Texas 79401
June 4	Amarillo Public Library 413 East Fourth Street Amarillo, Texas 79105
June 5	Austin Public Library 401 West Ninth Street Austin, Texas 78768
June 6	Waco Public Library 1717 Austin Avenue Waco, Texas 76701

To register for one of these workshops, please complete the attached registration form, indicating the location desired, and return it to Anne Hollingsworth, Texas State Library, Box 12927 Capitol Station, Austin, Texas 78711. Participants in the workshops are asked to bring their solar energy packets along with them.

Please return registration forms by May 4.

Registration Form

NAME

ADDRESS

CITY STATE ZIP

PHONE

LIBRARY

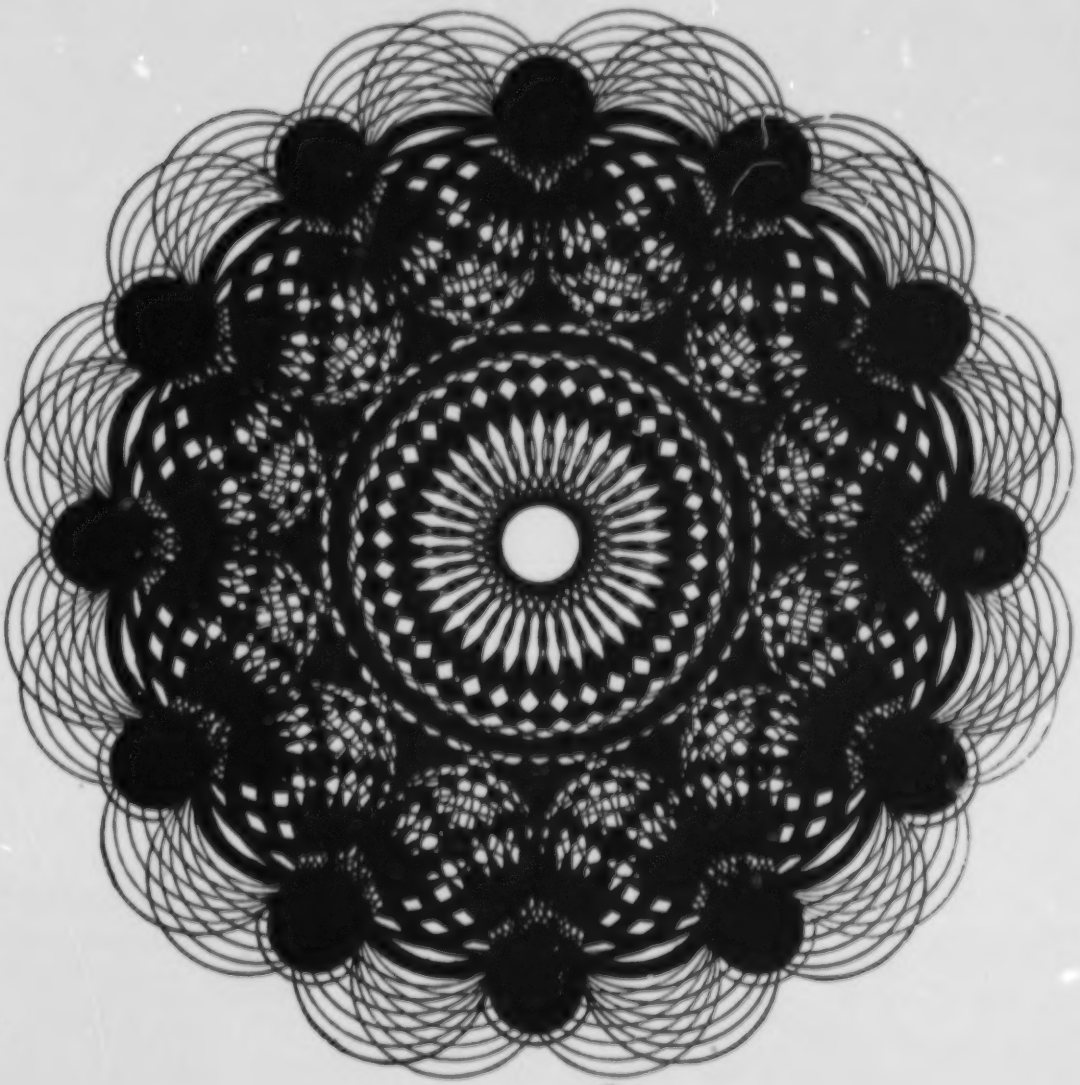
DATE AND LOCATION DESIRED

APPENDIX B

This form may be cut, stamped and mailed. Please return by May 4 to Anne Hollingsworth, Texas State Library, Box 12927 Capitol Station, Austin, Texas 78711.

The Energy Search Center

C



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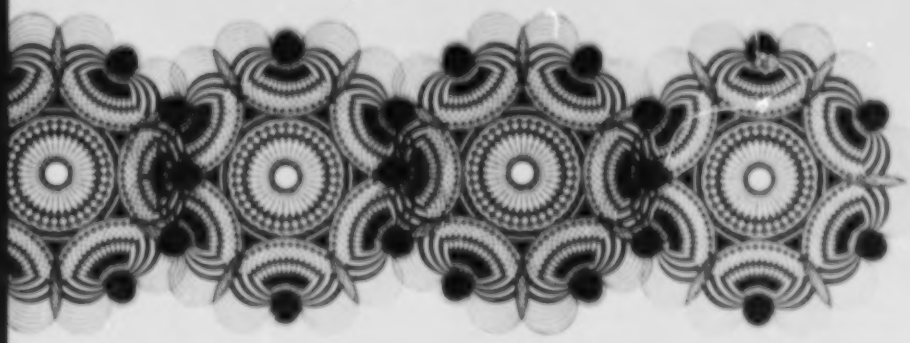

Now, simply by dialing (800)252-9323, you're in touch with the Texas Industrial Commission's Energy Search Center ... and millions of cost cutting pieces of information on industrial energy conservation.

TEXAS MANUFACTURERS

The Energy Search Center is at your disposal, free of charge, and designed to provide access to comprehensive information about industrial energy conservation including reports, articles, books, and monographs. Energy search specialists are here to take questions about your

A project of the Texas Energy Conservation Plan funded by the U. S. Department of Energy through the Governor's Office of Energy Resources. Sponsorship of seminars by the Texas Industrial Commission does not necessarily imply endorsement of materials, products, ideas and opinions presented.

answers to industrial energy —

answers to industrial energy —
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answers to industrial energy —

operation's particular energy utilization problems and to develop a strategy for retrieving the most current and relevant bibliographic information available. The Energy Utilization Department has set up a computerized, nationwide data retrieval service which accesses four of the country's major data base systems: Lockheed Information Systems, System Development Corporation, DOE/RECON, and the New York Times Information Bank.

Inquiring parties are provided with a printout of bibliographic information referring them to the world's most respected technical and professional publications. The print out is then forwarded to the requester, usually within five working days. After examination and upon request, copies of the available articles or reports are forwarded (at no charge for up to 100 pages, and a nominal charge per page thereafter).

The Center also maintains an extensive technical library of books, journals, periodicals, case study reports, and other energy-related documents for direct research.

Energy conservation information such as this has heretofore been available only through universities and private information sources which charge for both their research time and printouts.

All Texas manufacurers, as well as engineering and architectural consultants working with companies building or retrofitting plants in Texas, are invited to make use of this comprehensive, time- and money-saving service. When you have specific questions about industrial energy conservation in your plant — what's being done, what you can do, what the future energy picture looks like — call the Energy Search Center.

Energy won't be the only thing you save!

(800)252-9323

The ENERGY SEARCH CENTER is only one of six ENERGY UTILIZATION PROGRAMS developed by the Texas Industrial Commission to save Texas manufacturers money on

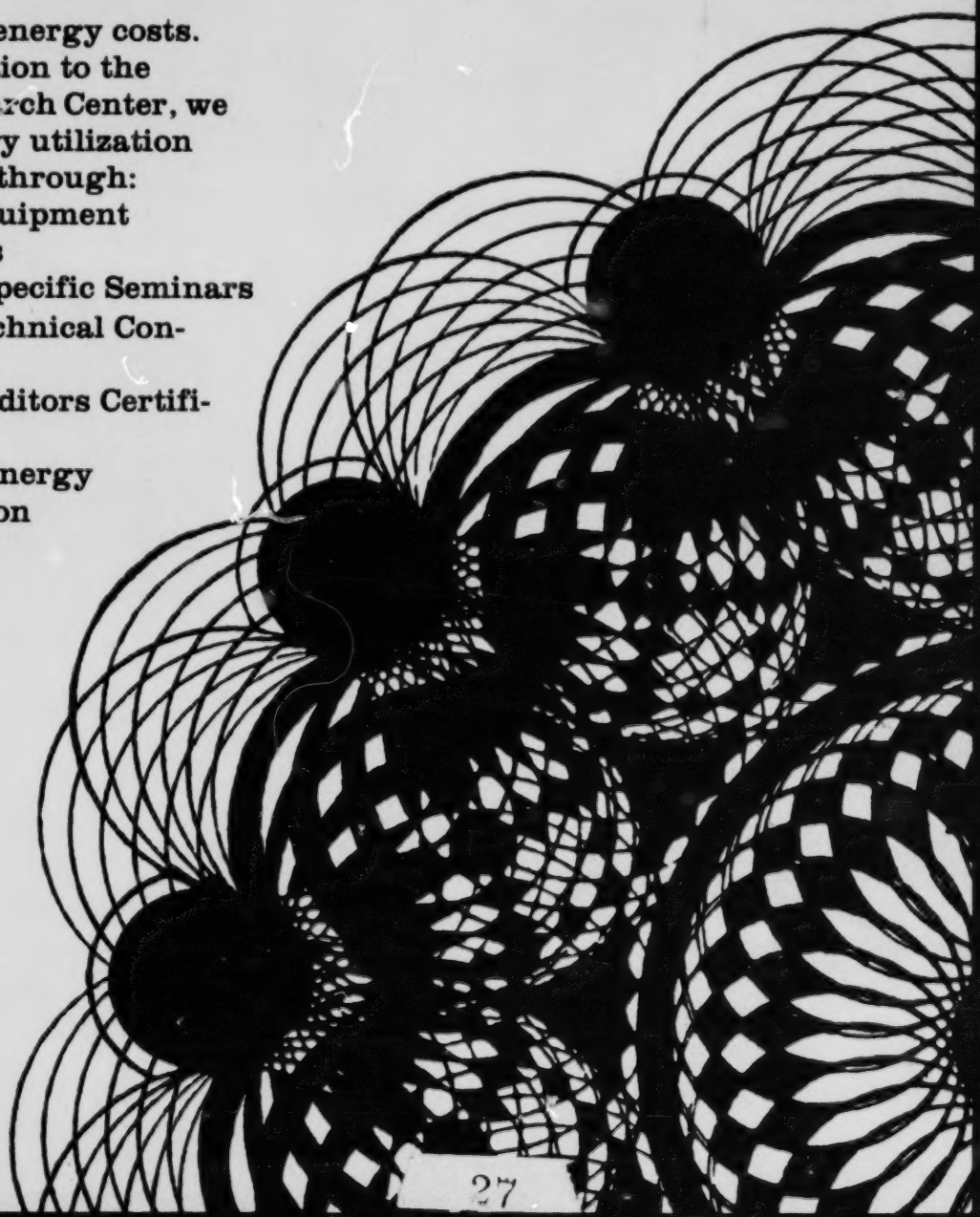
conservation problems

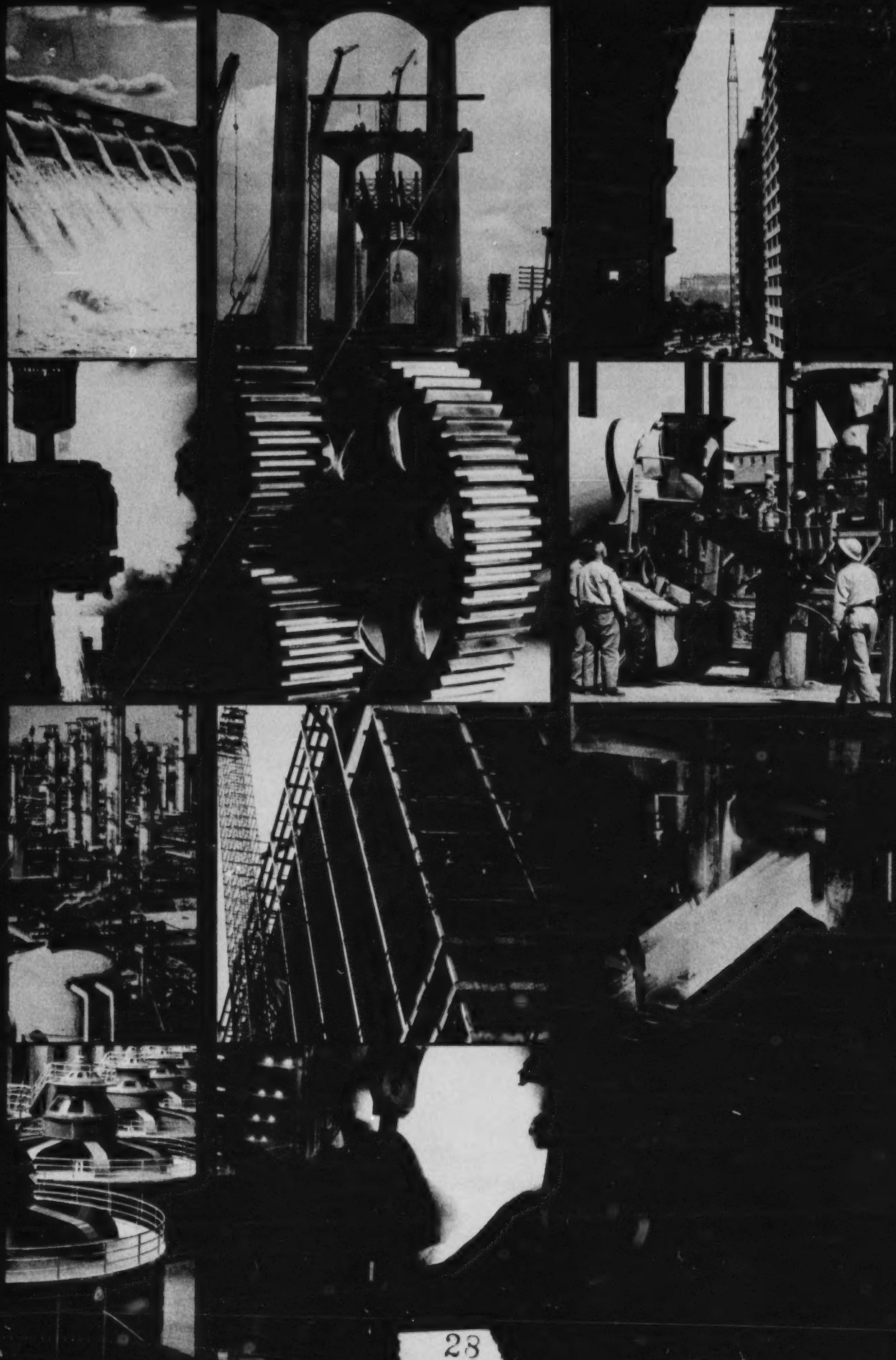
conservation problems
conservation problems
conservation problems

industrial energy costs.

In addition to the Energy Search Center, we offer energy utilization assistance through:

Process Equipment Workshops
Industry Specific Seminars
Annual Technical Conference
Energy Auditors Certification
Regional Energy Conservation Groups





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CTLS

Central Texas Library System

CTLS is . . . one of ten systems of public libraries in Texas

CTLS is . . . 30 counties in Central Texas with a land area of 25,639 square miles

CTLS is . . . 34 member libraries working together to serve 815,563 people

CTLS is . . . supported by state and federal funds

CTLS is . . . headquartered in the Austin Public Library

CTLS is . . . support services to member libraries

- . . Interlibrary Loan
- . . Consulting Services
- . . Collection Development Program
- . . Continuing Education Program
- . . Public Relations Program
- . . 16mm Film Program
- . . Books-by-Mail Program
- . . Spanish Language Deposit Collection
- . . Large Print Book Circuit

WHY SYSTEMS?

Cooperative efforts often allow the development of programs and services not feasible through individual efforts. Systems of public libraries allow their members to share resources -- materials, services, and the expertise of members. Working together, member libraries hope to improve library services in their communities and their regions.

TEXAS STATE LIBRARY SYSTEM

The state of Texas is divided into ten geographic systems, each headquartered in a major public library which provides service to all members of the system. The ten systems together comprise the Texas State Library System.

SYSTEM MEMBERSHIP

To become a member of a system, a public library must meet certain criteria in such areas as: size of collection, per capita tax support, staffing, and hours of service. The criteria vary according to the population served by the library.

In the Central Texas Library System, 34 libraries meet the necessary criteria and receive full benefits of the system. Another 19 libraries have not yet met the criteria but are still eligible for limited services.

STATE AND FEDERAL FUNDS

CTLS is supported by federal funds (through the Library Services and Construction Act) and by state funds (through the Library Systems Act) as administered by the Texas State Library. The funds are intended to supplement and encourage -- not replace -- local support.

HEADQUARTERS

The CTLS office is located in the Austin Public Library (the Major Resource Center); all staff, services, and materials are paid for through an annual contract between the City of Austin and the Texas State Library.

PROGRAMS

CTLS staff members develop and administer a variety of programs in response to needs expressed by member libraries; all programs and policies are approved by the CTLS Advisory Council after discussion at quarterly membership meetings.

SUPPORT SERVICES OF CTLS

...*Interlibrary Loan:* a library which does not own a particular book which a patron wants may borrow that book from another library through immediate access to a statewide network of libraries. A microform copy of the Austin Public Library catalog is mailed monthly to all members and the readers on which to use it are provided on indefinite loan.

...*Consulting Services:* professional librarians on the CTLS staff consult with librarians and interested citizens on all matters related to libraries -- e.g., establishment of services, improvement of services, book selection, and children's services.

...*Collection Development Program:* CTLS allocates a portion of its total funds each year to individual member libraries, the amount based on local funds spent for library materials. The funds are used for purchase of library materials and are coordinated through a central purchasing office.

...*Continuing Education:* each year CTLS conducts several workshops on topics of interest to members; member librarians also select professional materials for the libraries related to each workshop and receive subscriptions to two professional journals of their choice.

...*Public Relations:* the CTLS office provides professional expertise and publicity materials to member libraries to help make their communities more aware of services provided by libraries.

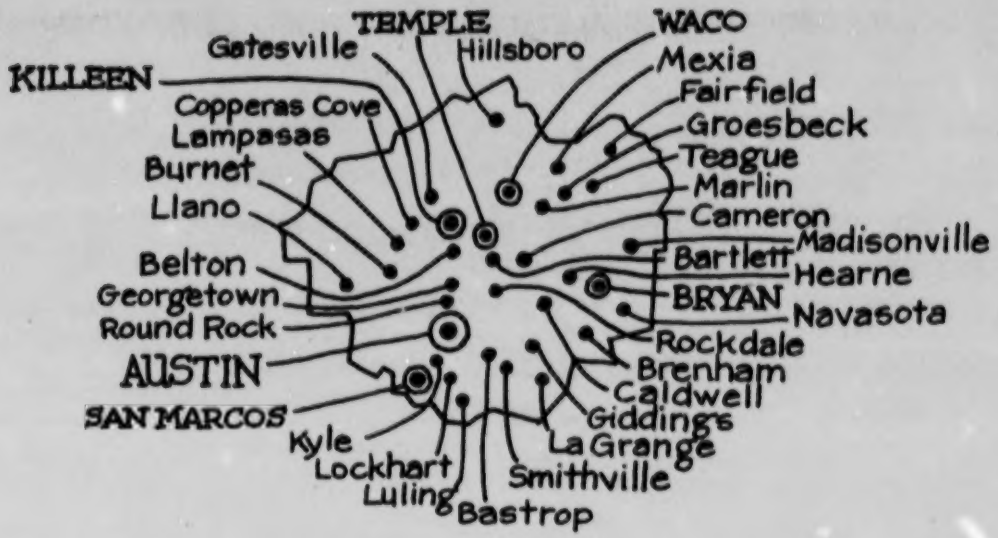
...*16mm Films:* all member libraries may borrow films from the newly established collection of films housed at system headquarters. A 16mm film projector is available to each member on indefinite loan.

...*Books-By-Mail:* CTLS maintains a collection of 8,000 paperback books which are circulated by mail directly to homebound and rurally isolated citizens. The 1,100 titles available are listed in one annual catalog and three supplements.

...*Resource Sharing:*

Large Print Book Circuit -- packets of books printed in larger-than-normal type rotate among member libraries for three-month periods, making a broad selection of such titles continuously available to patrons of all member libraries.

Spanish Language Deposit Collection -- over 600 children's and adult titles in Spanish may be checked out on six-month loan by member libraries for circulation to their patrons.



ADVISORY COUNCIL

Mr. J. B. Nickells (Luling), *Chairperson*
Mrs. Janis Tibbitts (Round Rock), *Vice-Chairperson*
Dr. Doris Webb (Burnet), *Secretary*
Mr. John Estes (Waco)
Mrs. G. E. Keith (Belton)
Mr. Sam Whitten (Austin)

CTLS STAFF

System Office: (512) 474-5355

Biruta Celmins Kearl, *Coordinator*
Karen A. Smith, *Collection Development Consultant*
Peggy Jemelka, *Children's & Outreach Consultant*
Mary E. Elton, *Administrative Aide*
Corinne Barho, *Purchasing Program Clerk*
Margaret Mendez, *Books-By-Mail Clerk*

Interlibrary Loan Office: (512) 472-0299

Carolyn Simon, *ILL Librarian*
Debi Morris, *ILL Assistant*
Patrick Kelly, *ILL Clerk*
Rebecca Otis, *ILL Clerk*
Mable Sikes, *ILL Clerk*

CTLS

Central Texas Library System
P.O. Box 2287
Austin, Texas 78768

North Texas Library System
9th & Throckmorton Sts.
Fort Worth, Texas 76102
817/335-6076

WHAT IS A SYSTEM?

The Texas Library System Act, passed in 1969, created 10 public library systems in Texas. Each is located around a large metro-library called a major resource center. Membership is voluntary and it is attained when a library reaches and maintains basic criteria developed by the Texas State Library, to which applications are made.

The major goal of the Library Systems Act is to provide better library service and resources for all Texans.

Services For NTLS Members:

- Collection Evaluation and Development
- Consultation Services
- Books-by-Mail to Homebound and Unserved Counties
- Film Services
- Public Relations Promotionals
- Continuing Education for Library Staff
- Resource Sharing

Other Advantages

Cooperative Purchasing

Special Bulk Discounts

Libraries Retain Local Autonomy

Funded by NTLS with a grant from Texas State Library through the Texas Library System Act (H.B. 260) and The Library Services and Construction Act (P.L. 95-123)

MEMBERSHIP OF NTLS

1. Arlington Public Library
2. Azle Public Library
3. Bedford Public Library
4. Blue Mound Public Library
5. Bowie Public Library
6. Bridgeport Public Library
7. Burkburnett Public Library
8. Burleson Public Library
9. Cleburne Public Library
10. Decatur Public Library
11. Denton (Emily Fowler P.L.)
12. Electra Public Library
13. Euless Public Library
14. Fort Worth Public Library (MRC)
15. Glen Rose-Somervell Pub. Lib.
16. Graham Public Library
17. Granbury (Hood County Library)
18. Grapevine Public Library
19. Haltom City Public Library
20. Henrietta (Edwards Public Lib.)
21. Hurst Public Library
22. Iowa Park Public Library
23. Keller Public Library
24. Lake Worth Public Library
25. Lewisville Public Library
26. Mineral Wells (Boyce Ditto Municipal Library)
27. Mansfield Public Library
28. Nocona Public Library
29. North Richland Hills Pub. Lib.
30. Olney High School Library
31. Pilot Point Community Library
32. Quanah (Hardeman Co. P.L.)
33. Richland Hills Public Library
34. River Oaks Public Library
35. Saginaw Public Library
36. Seymour (Baylor County Free Library)
37. Stephenville Public Library
38. Vernon (Carnegie City Co. Lib.)
39. Weatherford Public Library
40. White Settlement Public Library

THE NORTH TEXAS LIBRARY SYSTEM (NTLS)

Our Patron
Is
Your Library

NTLS, Fort Worth Texas
817—335-6

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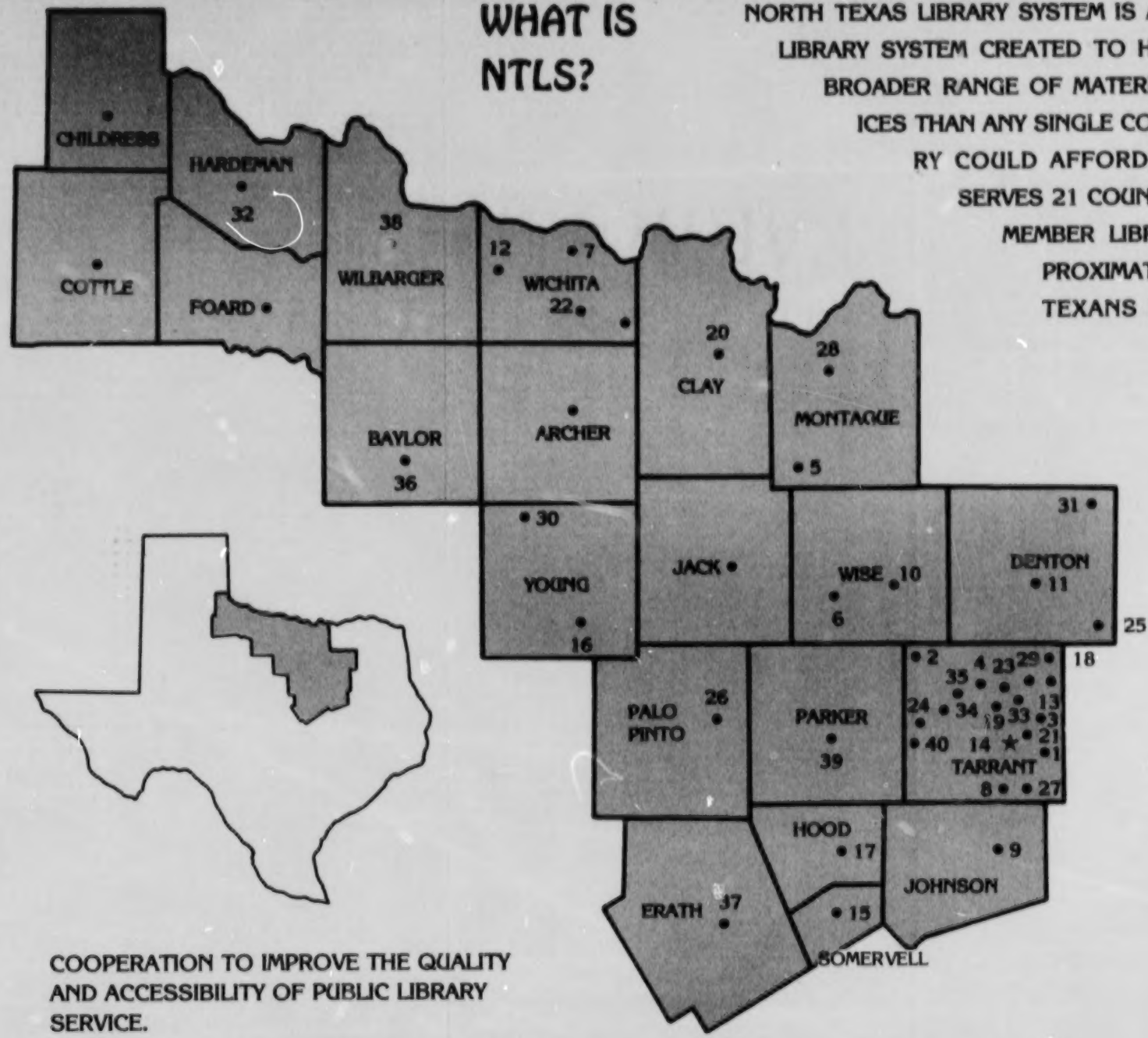
WHAT IS NTLS?

NORTH TEXAS LIBRARY SYSTEM IS A COOPERATIV
LIBRARY SYSTEM CREATED TO HELP PROVIDE
BROADER RANGE OF MATERIALS AND SER
ICES THAN ANY SINGLE COMMUNITY LIBR
RY COULD AFFORD. THIS SYSTE
SERVES 21 COUNTIES AND 40 (
MEMBER LIBRARIES . . . A
PROXIMATELY 1.4 MILLIO
TEXANS RESIDE WITHI
THE SYSTEM
BOUNDARIES



COOPERATION TO IMPROVE THE QUALITY AND ACCESSIBILITY OF PUBLIC LIBRARY SERVICE.

Student Characteristics Survey 1977-78

OHIO BOARD OF REGENTS

OHIO COUNCIL FOR INTER-INSTITUTIONAL RESEARCH

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LORAIN COUNTY COMMUNITY COLLEGE
1005 N. Abbe Road
Elyria, Ohio 44035

Dear Student:

This is a questionnaire concerning students enrolled in developmental education programs at Ohio colleges. The survey is being conducted by the Ohio Council for Inter-Institutional Research in cooperation with the Ohio Board of Regents.

Although you are not required to complete this questionnaire, your cooperation is appreciated and any information you provide will be kept confidential. In absolutely no case will the answers of individual students be singled out.

The questionnaire is designed to allow you to respond quickly and should only take a few minutes of your time.

1. STUDENT IDENTIFICATION NUMBER

1	2	3	4	5	6	7	8	9

2. CAMPUS AND CITY OR TOWN

_____ _____
10 11

3. SEX *(Check One)*

12
- 1 ☐ Male
- 2 ☐ Female

4. AGE *(Check One)*

13
- 1 ☐ Under 18 years
- 2 ☐ 18-20 years
- 3 ☐ 21-24 years
- 4 ☐ 25-34 years
- 5 ☐ 35-44 years
- 6 ☐ 45-54 years
- 7 ☐ 55-64 years
- 8 ☐ 65 years or over

5. RACE/ETHNIC *(Check One)*

14
- 1 ☐ American Indian or Alaskan Native
- 2 ☐ Asian or Pacific Islander
- 3 ☐ Black (Non-Hispanic)
- 4 ☐ Hispanic
- 5 ☐ White (Non-Hispanic)

6. ARE YOU A VETERAN? *(Check One)*

15
- 1 ☐ Yes
- 2 ☐ No

7. ARE YOU CURRENTLY RECEIVING ANY FINANCIAL AID? *(Check One)*

16
- 1 ☐ Yes
- 2 ☐ No

8. ARE YOU CURRENTLY EMPLOYED IN A JOB? *(Check One)*

17
- 1 ☐ Not employed
- 2 ☐ Employed 1-10 hours/week
- 3 ☐ Employed 11-20 hours/week
- 4 ☐ Employed 21-35 hours/week
- 5 ☐ Employed 36 or more hours/week

9. WHAT IS THE HIGHEST GRADE LEVEL YOU COMPLETED BEFORE ENROLLING AT THIS COLLEGE? *(Check One)*

18
- 1 ☐ Less than 8th grade
- 2 ☐ 8th grade
- 3 ☐ Some high school
- 4 ☐ High school graduate
- 5 ☐ One year or less of college
- 6 ☐ Two years or more of college
- 7 ☐ Associate degree
- 8 ☐ Bachelor's degree
- 9 ☐ Other (please specify) _____

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38A

The Northeast Texas Library System

(NETLS)

NORTHEAST TEXAS LIBRARY SYSTEM

What is NETLS?

The Northeast Texas Library System (NETLS) serves 33 counties to the north and east of Dallas, an area containing over 2 million people and covering 23,956 square miles. Dallas Public Library is the Major Resource Center for the system and houses the system headquarters. 51 of the 68 public libraries in this area are members of NETLS. The informational and cultural needs of the citizens of this system are diverse, but cooperation allows every member library to meet the challenge of bringing the best in library service to its own community.

Excellence—through Cooperation

System?

Good public libraries are important to all people but few communities are able to bear the cost of supplying all the services their citizens seek. Cooperative library systems were created to help provide a broader range of materials and services than any single community library could afford.

The Texas Library Systems Act, passed by the State Legislature in 1969, created public library systems in Texas. Each of the 10 existing systems is located around a large metropolitan library called a Major Resource Center. Membership is voluntary and is attained when a library reaches and maintains the basic criteria developed by the Texas State Library. Application for membership is made to the Texas State Library.

The major goal of the Library Systems Act is to provide better library service and resources for all Texas citizens. System libraries retain their local autonomy but join together to share strengths and help create a system program of service. Participating libraries enjoy the advantages of cooperative purchasing and processing and system-wide special services that include Books-By-Mail and 16mm Film Service. Cooperation by libraries of every size will help bring quality library service to all Texas citizens wherever they may live.

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(1)

ervices for NETLS Members

NETLS' Program of Service is developed biennially by the system members and services are changed as the needs of member libraries and their patrons change. Today the Northeast Texas Library System is currently providing these services:

- **Consulting Services**
- **Collection Evaluation and Development**
- **Books by Mail to Homebound and to Unserved Counties**
- **Film Service**
- **Printing, Programming and Exhibits**
- **Continuing Education for Library Staffs and Trustees**
- **Resource Sharing Pilot Project**

Individuals and groups desiring to establish or expand library facilities may secure further information by contacting:

Northeast Texas Library System
1954 Commerce Street
Dallas, Texas 75201
214/651-9266

ed by the Northeast Texas Library System with a grant from the State Library through the Texas Library System Act (H.B. 260) the Library Services and Construction Act (P.L. 95–123)

12/78

MEMBERS OF THE NORTHEAST TEXAS LIBRARY SYSTEM

1) Allen Public Library
214-727-5536

2) Henderson County / Clint W. Murchison Memorial Library / Athens
214-675-1717

3) Bonham Public Library
214-583-3128

4) Van Zandt County Library / Canton
214-567-4276

5) Carrollton Public Library
214-242-3408

6) Service League Library (Panola Co.) / Carthage
214-693-6741

7) Red River County Public Library / Clarksville
214-427-3991

8) Commerce Public Library
214-886-6858

9) Corsicana Public Library
214-872-3071

10) Daingerfield Public Library
214-645-2823

11) Dallas County Library
214-749-8566

12) Dallas Public Library (Major Resource Center)
214-748-9071

13) Denison Public Library
214-465-1797

14) Duncanville Public Library
214-298-5400

15) Ennis Public Library
214-875-2675

16) Manske Memorial Library / Farmers Branch
214-247-3131

17) Cooke County Library / Gainesville
817-665-2401

18) Nicholson Memorial Library / Garland
214-276-5178

19) Upshur County Library / Gilmer
214-843-3582

20) Lee Public Library / Gladewater
214-845-2640

21) Grand Prairie Memorial Library
214-264-1571

22) W. Walworth Harrison Public Library / Greenville
214-455-2205

23) Rusk County Memorial Library / Henderson
214-657-2757

24) Irving Municipal Library
214-253-2506

25) Jacksonville Public Library
214-586-4152

26) Kaufman County Library
214-932-6222

27) Kilgore Public Library
214-984-3315

28) Nicholson Memorial Library / Longview
214-758-4252

29) McKinney Memorial Library
214-542-7263

30) Malakoff Public Library
214-489-1818

31) Marshall Public Library
214-935-5241

32) Mesquite Public Library
214-285-6369

33) Muenster Public Library
817-759-4291

34) Mt. Pleasant Public Library
214-572-2705

35) Franklin County Library / Mt. Vernon
214-537-4916

36) Palestine Carnegie Library
214-729-4121

37) Paris Public Library
214-784-2758

38) Camp County Library / Pittsburg
214-856-3302

39) Plano Public Library
214-423-6502

40) Richardson Public Library
214-238-8251

41) Rockwall County Library
214-722-3230

42) Singletary Memorial Library / Rusk
214-683-5916

43) Sherman Public Library
214-893-7463

44) Sulphur Springs Public Library
214-885-4926

45) Carnegie Public Library / Terrell
214-563-6463

46) Texarkana Public Library
214-794-7911

47) Carnegie Public Library / Tyler
214-597-2061

48) Nicholas P. Sims Library / Waxahachie
214-937-2671

49) Whitesboro Public Library
214-564-5432

50) Whitewright Public Library
214-364-2955

51) Wylie Public Library
214-442-2716

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10. BEFORE YOU ENROLLED AT THIS COLLEGE, HOW MANY YEARS HAD IT BEEN SINCE YOU LAST ATTENDED ANY SCHOOL? *(Check One)*

19
- 1 ☐ Less than 1 year
- 2 ☐ 1-2 years
- 3 ☐ 3-5 years
- 4 ☐ 6-10 years
- 5 ☐ More than 10 years

11. HOW MANY CREDIT HOURS ARE YOU REGISTERED FOR THIS TERM? *(Check One)*

20
- 1 ☐ 1-3 credit hours
- 2 ☐ 4-6 credit hours
- 3 ☐ 7-9 credit hours
- 4 ☐ 10-12 credit hours
- 5 ☐ 13-15 credit hours
- 6 ☐ 16 or more credit hours

12. DO YOU FEEL YOU ARE PREPARED TO DO COLLEGE WORK? *(Check One)*

21
- 1 ☐ Yes
- 2 ☐ No

13. DO YOU NEED HELP IN IMPROVING YOUR: *(Check as many areas necessary)*

22 1 ☐ Writing skills
23 1 ☐ Reading skills
24 1 ☐ Notetaking skills
25 1 ☐ Outlining skills
26 1 ☐ Test-taking skills
27 1 ☐ Library and research skills
28 1 ☐ Math skills

14. DO YOU NEED HELP IN DECIDING OR PLANNING WHAT COURSES TO TAKE? *(Check One)*

29
- 1 ☐ Yes
- 2 ☐ No

15. DO YOU NEED HELP IN DECIDING OR PLANNING FOR A JOB OR CAREER? *(Check One)*

30
- 1 ☐ Yes
- 2 ☐ No

16. DO YOU THINK THAT YOU WILL HAVE TROUBLE PASSING ANY OF YOUR COURSES? *(Check One)*

31
- 1 ☐ Yes
- 2 ☐ No

40

17. WHY ARE YOU ENROLLED AT THIS COLLEGE? *(Check all reasons that apply)*

32 1 ☐ To get a full-time job
33 1 ☐ To get a degree
34 1 ☐ To discover my vocational interest
35 1 ☐ To prepare for a new career
36 1 ☐ To improve my knowledge and the technical skills required in my present job
37 1 ☐ To increase my chances for a possible raise and/or possible promotion in my present job
38 1 ☐ To complete courses necessary to transfer to a four-year school
39 1 ☐ To learn specific skills that will enrich my daily life
40 1 ☐ To improve my ability to get along with people
41 1 ☐ To become actively involved in student life and campus activities
42 1 ☐ To increase my participation in cultural and social events
43 1 ☐ To improve my confidence in myself
44 1 ☐ To meet people
45 1 ☐ To improve my leadership skills
46 1 ☐ To improve my lifestyle
47 1 ☐ To complete high school (GED)
48 1 ☐ Other (please specify) _____

18. WHAT CERTIFICATE OR DEGREE ARE YOU PLANNING TO EARN FROM THIS COLLEGE? *(Check One)*

49
- 1 ☐ Not seeking a certificate or degree; only registered for selected courses
- 2 ☐ Certificate of less than one-year
- 3 ☐ Certificate of one year or more
- 4 ☐ Associate degree
- 5 ☐ Baccalaureate degree

19. WHICH BASIC SKILLS DEVELOPMENTAL EDUCATION CLASSES ARE YOU CURRENTLY ENROLLED IN AT THIS COLLEGE? *(Check all that apply)*

50 1 ☐ Reading
51 1 ☐ Writing
52 1 ☐ Mathematics
53 1 ☐ Other (please specify)_____

_____

20. WHY DID YOU ENROLL IN THESE BASIC SKILLS DEVELOPMENTAL EDUCATION CLASSES? *(Check all reasons that apply)*

54 1 ☐ Advice of my college counselor
55 1 ☐ Advice of my college advisor
56 1 ☐ Advice of a college faculty member
57 1 ☐ Read about the program in the catalogue or other campus publication
58 1 ☐ Advice of a high school teacher or counselor
59 1 ☐ Recommended on the basis of test scores
60 1 ☐ Heard about the program from friends
61 1 ☐ Other (please specify) _____

_____

21. ARE YOU CURRENTLY PARTICIPATING IN ANY OF THE FOLLOWING SPECIAL PROGRAMS? *(Check all programs that apply)*

62 1 ☐ Learning Laboratory
63 1 ☐ Mini-courses
64 1 ☐ Minority programs
65 1 ☐ Tutoring
66 1 ☐ Other (please specify) _____

_____

THANK YOU FOR COMPLETING THIS SURVEY

41 A

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Freedom of the mind
through information

South Texas Library System

STLS

505 N Mesquite
Corpus Christi Texas 78401
Systems Office 882-6502
Film Library 882-1974
Reference Back-Up 882-6503
Inter-Library Loan 882-6539

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Have you ever ordered something, paid for it and then not picked it up?—of course you haven't . . . or have you.

When was the last time you called your local public library when you needed information—perhaps for a business presentation, a speech for a civic group or a sales pitch? If you can't remember then maybe it's time you took a look at what's happened in libraries since your last visit.

Your local public library is funded by tax money—your tax money—so why don't you use it? The answer is probably that like many other people you view the library as a good thing but not as something that is a part of your day to day world.

Public libraries, like most other things, have changed a lot in the past few years. But unlike the nickel candy bar which has gotten smaller and is now a dime, libraries are offering more and better services than ever before. This has come about to a great extent by the development of library systems. Libraries have been grouped together into systems so that they can provide services to the public that they would never be able to afford on an individual basis.

For instance—you're preparing a speech and you need background information as well as related information to make your point. You call the library and they get the information for you. If your request goes beyond their reference capabilities then they have the system to back them up. Through the system's vast resources of information you will get the material you need. It might take a day, it might take a week—the important thing is that you will get as much pertinent information as possible.

Another example is the inter-library loan service. If the library doesn't have a book you want—for business or pleasure, it doesn't matter—then through the system the library can get the book for you.

The film service is also a very important aspect of the system. Over 600 films, ranging in topics from advertising to mountain climbing, are available to you through your local public library and the system.

What a package! All those services just for you and all you have to do is pick up the telephone and dial your local public library!

The South Texas Library System is made up of thirty-nine libraries. Corpus Christi Public Library, the Major Resource Center, was designated as the central library for referral from area libraries in the system, for cooperative service with other libraries, and for federated operations with other libraries in the system. The system is also headquartered in Corpus Christi.

Library systems were formed to improve library services and to make their resources accessible to all residents of the area which the member libraries collectively serve. The result of this is that member libraries are able to offer their patrons things such as the film service, the information service and the inter-library loan service. In addition to these services the system also aids the member libraries in many areas relating to operation and support.

The System, Member Libraries and You-Working Together to Make a Good Thing Better-Libraries and South Texas

Major Resource Center

Corpus Christi Public Libraries
505 North Mesquite Street
Corpus Christi, Texas 78401
882-1937

Member Libraries

Jim Wells County Library
401 East Third Street
Alice, Texas 78332
664-9506

Cameron County Library System

Texas Southmost City-College Library
1825 May Street
Brownsville, Texas 78520
546-0554

Harlingen Public Library
504 East Tyler Street
Harlingen, Texas 78550
423-3563

Bailey H. Dunlap Memorial Library
Box 965
La Feria, Texas 78559

Laguna Vista Public Library
Star Route, Box 105
Port Isabel, Texas 78578
943-1793

Ethel L. Whipple Memorial Library
Ocean Boulevard
Los Fresnos, Texas 78566
233-5330

Cuero Public Library
207 East Main
Cuero, Texas 77954
275-2864

Ed Bachel Memorial Library
203 South Henry Street
Falfurrias, Texas 78355
325-2144

Live Oak County Library
Box 698
George West, Texas 78022
449-3191

Gonzales Public Library
415 St. Matthew Street
Gonzales, Texas 78629
672-6315

Friench Simpson Memorial Library
4th and Kelly Streets
Hallettsville, Texas 77964
798-3243

Jim Hogg County Library
210 North Smith Avenue
Hebbronville, Texas 78361
527-3421

Hidalgo County Library System

Donna Public Library
301 South Main
Donna, Texas 78537
464-4091

Edinburg Public Library
401 East Cano Street
Edinburg, Texas 78539
383-6246

Elsa Public Library
P. O. Box 98
Elsa, Texas 78543

McAllen Memorial Library
601 North Main
McAllen, Texas 78501
682-4531

Mercedes Memorial Library
434 South Ohio
Mercedes, Texas 78570
565-2371

Mission Public Library
118 East 11th
Mission, Texas 78572
585-5221

Pharr Memorial Library
130 East Caffery
Pharr, Texas 78577
787-3966

Porter Doss Memorial Library
515 South Kansas
Weslaco, Texas 78596
968-2272

Robert J. Kleberg Public Library
220 North Fourth
Kingsville, Texas 78363
592-6381

Calhoun County Library
301 Ann
Port Lavaca, Texas 77979
552-2661

Baber Memorial Library
4th and Main
Raymondville, Texas 78580
689-2930

Alpha Municipal Library
110 North Fourth Street
Robstown, Texas 78380
387-2341

Nueces County Library
County Building
Robstown, Texas 78380
387-1032

Aransas County Public Library
Aransas County Courthouse
Rockport, Texas 78382
729-2390

San Benito Public Library
251 East Stenger Street
San Benito, Texas 78586
399-2311

San Patricio County Library System

Aransas Pass Public Library
110 North Lamont
Aransas Pass, Texas 78336
758-2350

Gregory Public Library
Gregory City Hall
Gregory, Texas 78359
643-6562

Ingleside Public Library
Drawer 400
Ingleside, Texas 78362
776-2517

Mathis Public Library
San Patricio Avenue
Mathis, Texas 78368

Odem Public Library
301 Humphrey Street
Odem, Texas 78370

Mary and Joff Bell Public Library
8th and Austin
Portland, Texas 78374
643-6527

Sinton Public Library
212 East Sinton Street
Sinton, Texas 78387
364-4545

Taft Public Library
501 Green Avenue
Taft, Texas 78390
528-3050

Victoria Public Library
302 North Main
Victoria, Texas 77901
578-6241

Yoakum Public Library
206 Hugo
Yoakum, Texas 77995
293-5001

Yorktown Public Library
P.O. Box 308
Yorktown, Texas 78164
564-3232

Funded by South Texas Library System with a grant from the Texas State Library through the Texas Library Systems Act (H.B. 260) and the Library Services and Construction Act (PL 91-600)

THE TEXAS PANHANDLE LIBRARY SYSTEM IS: G

A cooperative partnership between twenty autonomous local public libraries and the Texas State Library, created to improve and strengthen library service to all Texas citizens.
One of 10 regional library systems created by the Texas State Legislature in 1969 and funded through the Texas State Library since 1975.
Advised by library-minded citizens representing member libraries. TPLS develops programs of library service to reflect local needs.
Reaching, through the spirit of cooperation, towards the goal of good and equal library service for all citizens.
Administered by the Director of the Major Resource Center (MRC), and the System Coordinator.
Housed in the Amarillo Public Library, 413 E. 4th, Amarillo, Texas.

TEXAS PANHANDLE LIBRARY SYSTEM SERVICES:

Administration, Consulting, Continuing Education

Area public librarians are given the opportunity to learn new skills and strengthen their understanding of library work through system-sponsored workshops, free consultations with professionally trained librarians, and free use of library-oriented publications. Communities planning to develop public library service may request assistance from System staff.

Collection Development

Book holdings of area libraries are strengthened by funds for book purchases, free subscription to book rental services, duplicate titles from the MRC collection on extended loan, and discarded MRC books on permanent loan.

Film Service

Panhandle citizens are offered free use of 16mm films from either rotating packets or the Amarillo Public Library's film collection ordered through their local libraries.

Cassette Tape Service

Cassette tapes, both from rotating packets and from the Amarillo Public Library collection, are available in most member libraries.

Publicity and Public Relations

strengthen their understanding of library work through system-sponsored workshops, free consultations with professionally trained librarians, and free use of library-oriented publications. Communities planning to develop public library service may request assistance from System staff.

Collection Development

Book holdings of area libraries are strengthened by funds for book purchases, free subscription to book rental services, duplicate titles from the MRC collection on extended loan, and discarded MRC books on permanent loan.

Film Service

Panhandle citizens are offered free use of 16mm films from either rotating packets or the Amarillo Public Library's film collection ordered through their local libraries.

Cassette Tape Service

Cassette tapes, both from rotating packets and from the Amarillo Public Library collection, are available in most member libraries.

Publicity and Public Relations

Member libraries have the free use of a professional artist and a designated amount of money to be used for publicity tailored to local needs, as well as access to a pool of display materials housed in the MRC.

Books By Mail

Free paperback books are loaned to Panhandle residents who are not served by local libraries.

Reciprocal Borrowing

Library patrons are given free access to book holdings of neighboring libraries.

Art Reproductions

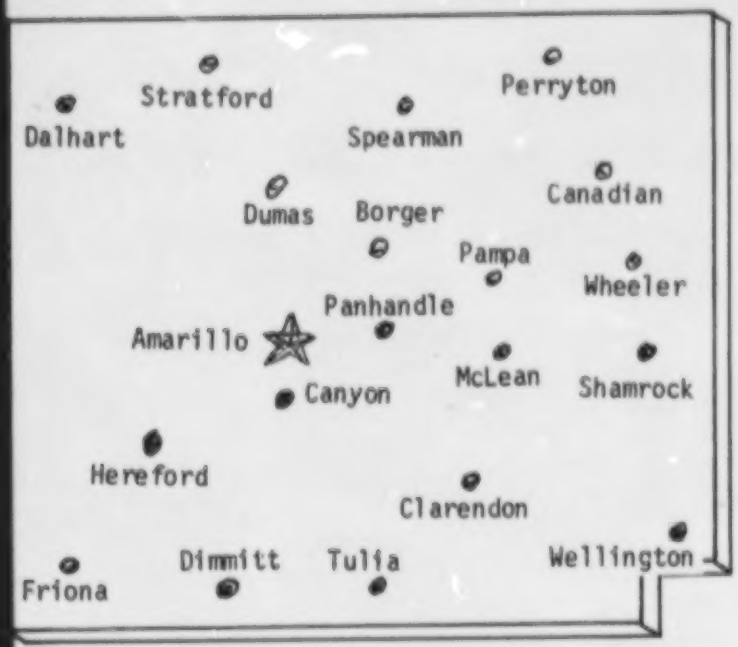
Member libraries have rotating collections of framed art prints for circulation to their patrons.

Printing is funded by the Texas Panhandle Library System with a grant from the Texas State Library through the Texas Library Systems Act (H.B. 260) and the Library Services and Construction Act (P.L. 95-123).

Interlibrary Loan

Patrons of system-member libraries have full access to ten major Texas public libraries and thirty-six Texas academic libraries, as well as limited access to out-of-state libraries, through the Texas State Library Communications Network. The Network, supported with state funds, supplies citizens with books, magazine articles, government documents and answers to reference questions unavailable in their local public libraries.

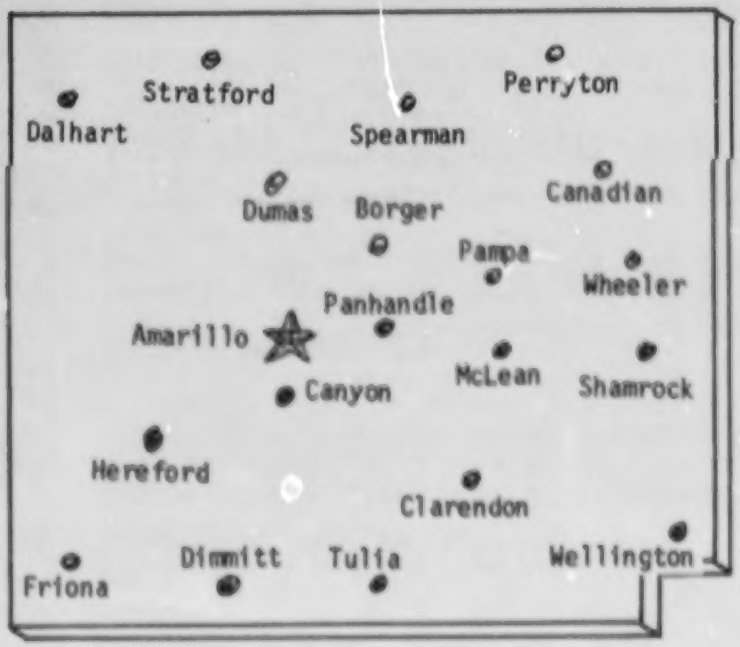
If a library patron cannot find the material he or she needs in the local library, the librarian may call the Amarillo Public Library. If it is not owned there, interlibrary loan staff members will, through various location devices, find out what libraries do own it and teletype the request. The item will eventually be sent to the original requesting library, where the patron may check it out and use it without a fee.



Texas Panhandle Library System

☆ MAJOR RESOURCE CENTER

● SYSTEM MEMBER LIBRARIES



TEXAS PANHANDLE LIBRARY SYSTEM

★ MAJOR RESOURCE CENTER

● SYSTEM MEMBER LIBRARIES

TEXAS PANHANDLE LIBRARY SYSTEM

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The Texas Trans-Pecos Library System IS:

- ★ A partnership among local public libraries and the Texas State Library which was created to strengthen library services to the Citizens of Texas.
- ★ One of 10 regional library systems legislated in 1969 by the Texas State Legislature and funded through the Texas State Library since 1975.
- ★ Charged with the responsibilities of providing library services to residents who do not have access to a local public library, and to support the sharing of library resources throughout the TTPLS region.
- ★ Composed of 9 counties, which cover over 10,000 square miles and contain over 400,000 residents: Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, Pecos, Presidio, Reeves, and Terrell.
- ★ Governed by representatives of local member public libraries. TTPLS develops programs of library service to reflect local needs.
- ★ Administered by the Director of the Major Resource Center, El Paso Public Library, and the System Coordinator.
- ★ Located in the El Paso Public Library, 501 N. Oregon St., El Paso, Texas 79901.

Texas Trans-Pecos Library System SERVICES:

Books by Mail

All rural residents of the Trans-Pecos area annually receive a catalog of paperback books which are available on loan from the TTPLS office. Popular fiction and non-fiction books in both Spanish and English are available to readers of all ages.

Coordination & Consultation

Librarians in the public libraries in the Trans-Pecos are given the opportunity to learn new skills and to strengthen their understanding of library work through workshops given by the Texas Trans-Pecos Library system. Public librarians may request assistance at any time from the Systems office. Communities planning to develop public library service may request assistance from the Texas Trans-Pecos Library Systems office.

Collection Development

Since the initiation of the Texas Trans-Pecos Library System, over $100,000 have been made available to public libraries to strengthen holdings in such areas as reference books, materials for children, and general book collections.

Audio-Visual Services

A collection of over 900 films, housed in the El Paso Public Library, is available to citizens through system member libraries. In addition, film projectors, and

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Audio-Visual Services

A collection of over 900 films, housed in the El Paso Public Library, is available to citizens through system member libraries. In addition, film projectors, and other audio-visual support equipment have been deposited in local public libraries.

Art Prints & Cassettes

Fine art reproductions, housed in local public libraries are available for check-out from system member libraries. Cassette tapes, including popular, classical, and country-western music, as well as children's stories, are also available for check-out. Cassette players and headphones are also on deposit from TTPLS.

Public Information Project

Designed to acquaint residents of the Trans-Pecos region with public library services available to them, this program includes the planning, designing, printing, and distribution of information. A graphics department, housed in the El Paso Public Library, provides assistance to local public libraries in preparing materials for the public information project.

Inter-library Loan (funded through Texas State Library)

If a local public library does not have a book or magazine which a patron needs, the librarian may request this material from the Inter-Library Loan Office, housed in the El Paso Public Library. Inter-Library Loan is a service offered to the Trans-Pecos libraries through the Texas State Library Communications Network. Teletype and telephone communication make needed materials accessible to local library users in a very short time.

A LOOK AT WHAT THE TEXAS TRANS-PECOS LIBRARY SYSTEM HAS PROVIDED TO TRANS-PECOS RESIDENTS . . .

BOOKS BY MAIL.....23,012 books loaned from 1975 to 1977

INTERLIBRARY LOAN.....12,872 books loaned and borrowed

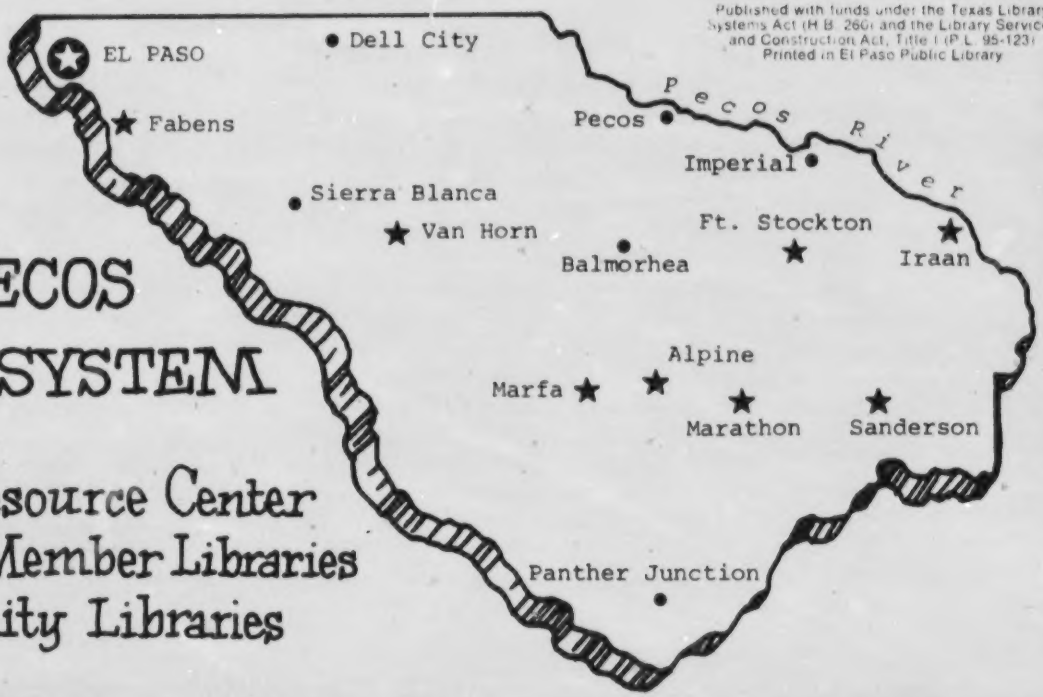
COLLECTION DEVELOPMENT.....11,463 books added to libraries

AUDIO-VISUAL SERVICES.....62,082 viewed films

COORDINATION & CONSULTATION.....170 librarians attended workshops

Published with funds under the Texas Library Systems Act (H.B. 260) and the Library Services and Construction Act, Title I (P.L. 95-123)
Printed in El Paso Public Library

TEXAS TRANS-PECOS LIBRARY SYSTEM



- ✪ Major Resource Center
- ★ System Member Libraries
- • Community Libraries

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Printed in El Paso Public Library

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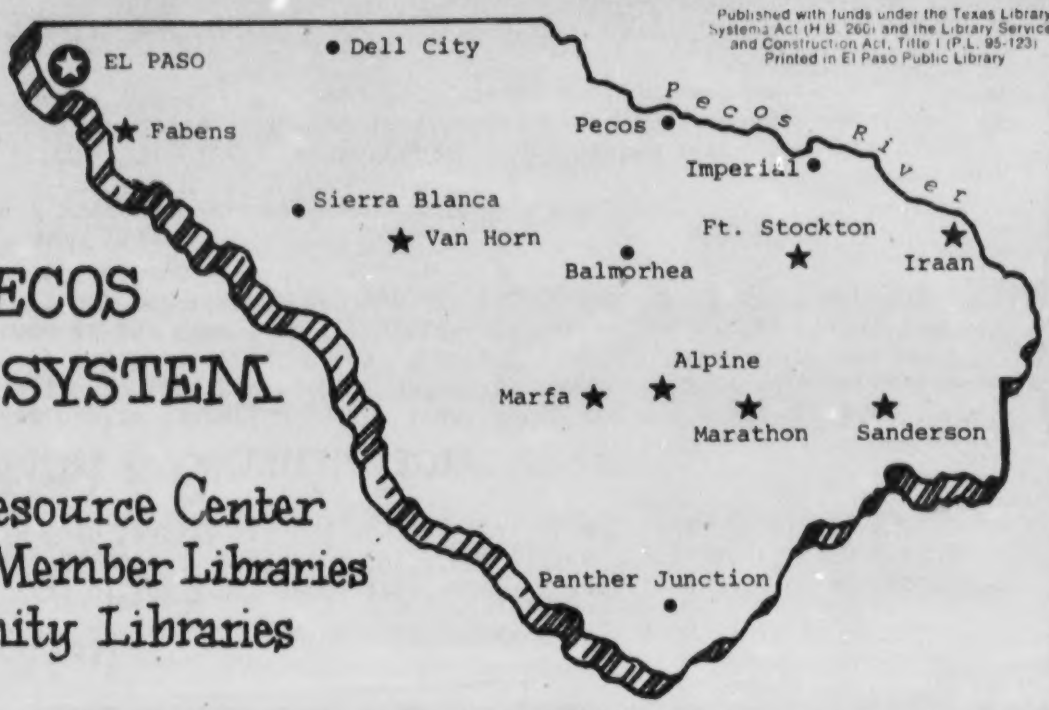


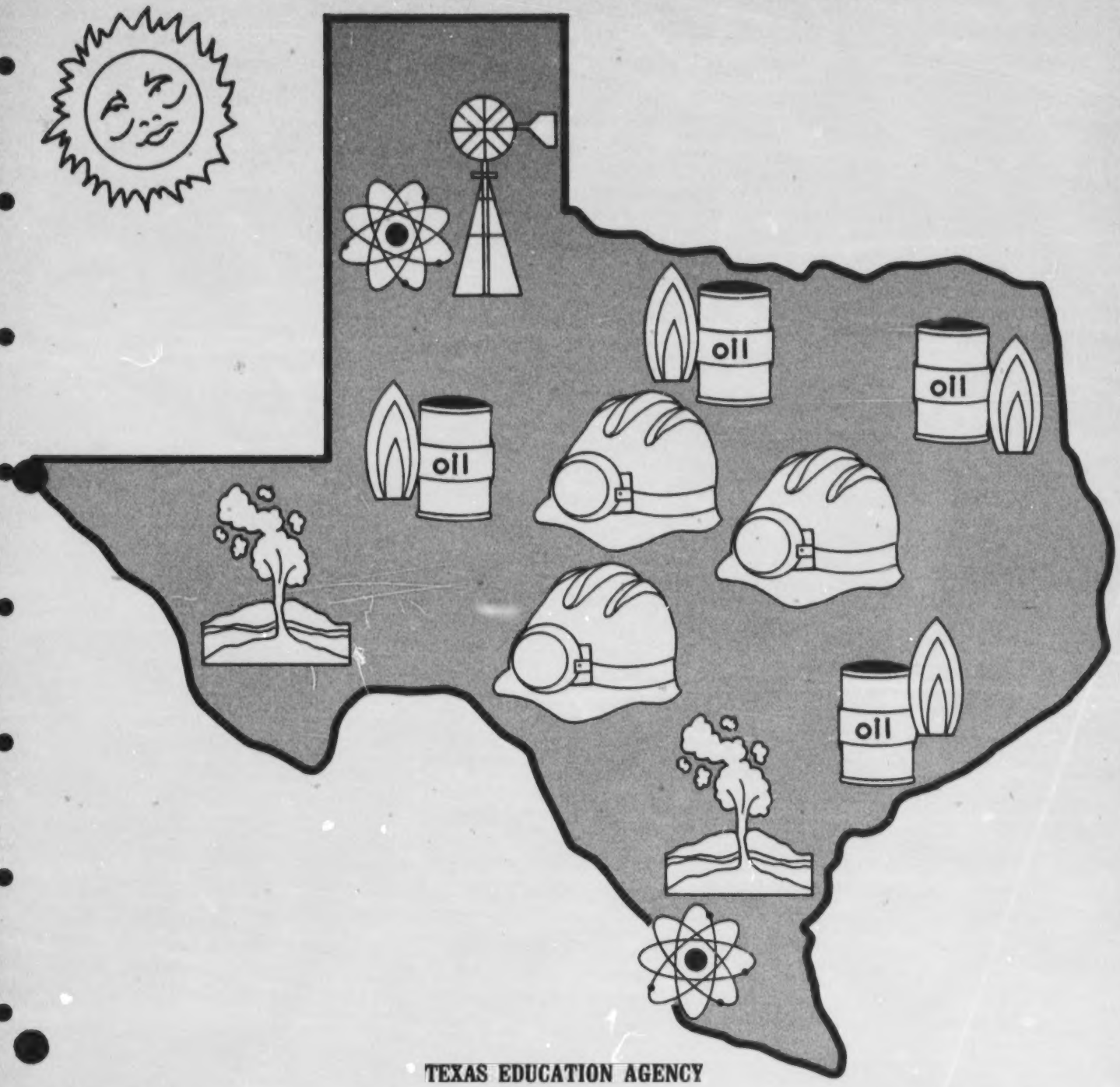
- ✪ Major Resource Center
- ★ System Member Libraries
- • Community Libraries

TEXAS TRANS-PECOS LIBRARY SYSTEM

serving all residents west of the Pecos

TEXAS ENERGY EDUCATION FRAMEWORK

I



TEXAS EDUCATION AGENCY
AUSTIN, TEXAS
1979

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Austin, Texas 78701
1979

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FOREWORD

The *Texas Energy Education Framework* is designed to assist teachers, administrators, and other school personnel in the process of infusing energy education concepts into the public school curriculum. The *Framework* focuses on the basic concerns and needs of people as related to energy and suggests ways in which energy conservation can become a meaningful part of all disciplines in elementary and secondary schools.

We hope that the *Framework* will be a useful tool in helping young people become more aware of the critical decisions which we all face in meeting the present and future energy needs of our state and nation. The future of our society will depend in large measure on the thoughtfulness and wisdom of these decisions.

M.L. Brockette
Commissioner of Education

ACKNOWLEDGMENTS

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RATIONALE

The State of Texas assumes a position of national leadership in agricultural and industrial development. Its bounty of natural resources and variety of terrain and climate attract people from throughout the world. Texas' population is more than double that of the last decade. Texas citizens, like those across the nation, are enjoying the benefits of rapid technological development; life is becoming more comfortable, safe, and rewarding. These are very positive developments in which the people of Texas can take justifiable pride. Hard work and creative thinking, indeed, produce the "good life" in our state. Unfortunately, these same factors of rapid population growth and technological developments result in greater and greater demands on our state and national supply of energy. We are consuming energy faster than the supply is being replenished. The shortage is becoming more critical, and society depends on current and future decisions we make regarding our use of energy resources. Energy conservation is a most critical world, national, state, community, and personal priority.

Few people take issue with the fact that conservation of energy is essential. What is planned, developed, and accomplished in the area of energy conservation is the collective result of the individual efforts of Texas people. One person cannot even address a problem of this magnitude, let alone work out a solution. Each person can only react to the problem as it affects his or her personal life. There are certain basic concerns of people which relate directly to the quality of life they can expect to have. When people realize that the future availability of energy directly affects their personal health, ability to work, and ability to enjoy the fruits of their labor, they begin to take action.

This framework for energy education in Texas schools is designed to address the problem of energy consumption from the standpoint of each individual and to suggest the effect which wise use of energy can have on the quality of life. The basic concerns of all people include personal health and well-being, career choice and development, consumer activity, enjoyment of leisure time, and a satisfying role in society. This framework demonstrates how each person's use of energy directly affects these basic concerns. For example, a diminished supply of energy directly impacts the consumer. The price of gasoline continues to rise, thereby causing each person to spend a greater proportion of personal income on fuel. It also causes local shortages which restrict travel, spoil vacation plans, and even affect employment and home location. There are steps which each person can take to moderate the use of gasoline and therefore avoid family budget problems and inconveniences which a critical shortage would produce. This framework systematically addresses individual problems and focuses on the questions: "How can energy conservation affect me, and how will alternative energy resources affect me in the future?"

An effort is made to relate the basic concerns of people to experiences which they have as elementary school students, middle school students, and young adults in the high school. People of all ages have concerns related to personal health and well-being, career choice or development, recreation, money supply, and social interaction. The framework directs attention to these concerns and to the relationship of individual use of energy. The concepts, applications, and values are outlined in a K-Grade 12 continuum which is designed for infusion into the regular curriculum offerings of the school.

GOALS

The student will:

- Help to make conservation of energy a national, state, community, and personal priority
- Become aware of one's role as a consumer and conserver of energy
- Be familiar with the various types of energy and how they can be changed from one form to another
- Be familiar with the major career opportunities in the energy field
- Understand the legal/social implications in the production and use of various types of energy
- Understand the environmental and economic impact of the use of energy and the effect which this may have on each person's life style
- Understand the effect of energy production on the Texas economy

DESCRIPTION OF THE ENERGY EDUCATION MATRIX

The following Energy Education Matrix serves as a basis for formulation of the Texas Energy Education Framework. It is designed to ensure the development of learning activities directly related to the personal concerns of people. The basic concerns of people listed on the horizontal axis are:

- Consumer Behavior
- Personal Health and Well-being
- Career Choice and Development
- Leisure Time and Recreational Activity
- Social-Legal Interaction of People

It is assumed that students will need learning experiences in three basic dimensions which relate energy education to these personal concerns. These dimensions listed on the vertical axis of the Matrix are:

- Knowledge (Concepts)
- Applications of Knowledge (Activities)
- Values and Attitudes

The interaction of the basic concerns of people (horizontal axis) and the dimensions of learning (vertical axis) create 15 instructional development cells. For example, in Cell One, the interaction of personal consumer concern and content knowledge creates a base for design of learning content related to consumer behavior. Such topics as the relationship between energy supply and price, wise shopping for energy-efficient appliances, the effect of energy shortage on the quality of goods and services, the relationship to personal comfort, the cost effectiveness concept, and selection of clothing for different seasons could be developed using this cell as a planning base.

Cell Eight, created by the interaction of educational applications as related to career concerns of people, creates a planning base for student understanding of how changes in energy supply will affect job opportunities in future years. For example, the student will be able to see how new sources of energy such as wind, solar, and geothermal, will offer new career opportunities. Such concepts as the effect of energy shortage on the recreational industry, on new energy forms related to engineering job opportunities, and on applications of solar energy (including opportunities for development of extra-terrestrial collectors) would be included. The career opportunities exploration and selection process will undergo tremendous change in application during the coming years. All phases of curriculum should reflect not only changes in job opportunities but the need for early exploration, planning, and proper training for the world of work in the future. This cell, like all others, is only intended as a springboard in the area of curriculum planning and by no means presents all of the possible applications.

USE OF ENERGY EDUCATION CHARTS

The following charts present an array of examples delineating the kinds of learning experiences that could be designed using each of the 15 cells as a planning base. The curriculum designer or teacher can, from this kind of base, delineate a multitude of learning activities for each cell as they relate to science and social studies as well as to all other disciplines. The basic concepts and educational programs which follow are all based on the use of this Energy Education Matrix as a planning base. Items included, such as descriptors in the Matrix, are by no means all inclusive but only represent examples of the kinds of learning experiences that can be infused into all phases of the elementary and secondary school curriculum.

ENERGY EDUCATION MATRIX

	Consumer	Individual Well-Being	Career	Recreational	Socio-Legal
Knowledge	(1) Knowledge of energy conservation affects consumer behavior.	(2) Individual health and well-being are directly affected by energy use.	(3) Changing patterns of energy use and energy resources affect career opportunities now and in the future.	(4) Energy shortages and changing patterns of use affect the recreational activities of all people.	(5) Changing patterns of energy consumption and energy regulations affect individual lifestyle and the world society.
Application	(6) Applications of consumer knowledge relate to energy conservation.	(7) Application of energy conservation techniques improves individual health and well-being.	(8) Educational requirements for new jobs resulting from energy conservation and alternative resources are changing rapidly.	(9) Applications of information regarding wise use of energy affect the use of leisure time.	(10) Application of social-legal knowledge related to energy conservation and energy production affects the ability of each individual to live in harmony with other people of the world.
Values	(11) Consumer values affect the total use of energy.	(12) Personal values related to energy use affect the health and well-being of each individual.	(13) Career values and work ethics relate to the changing energy picture and job satisfaction.	(14) Personal values regarding the use of energy for recreation affect the total consumption of energy.	(15) Social and political values are directly related to availability of energy and influence its research, transportation, and consumption.

INTRODUCTION TO MATRICES K-GRADE 3, GRADES 4-6, GRADES 6-8, GRADES 9-12

The need for energy education is critical and should be infused at all instructional levels and in all subjects. Toward this end, matrices of instructional cells for energy education have been developed for Kindergarten through Grade 3, for Grades 4 to 6, for Grades 6 to 8, and for Grades 9 to 12. Although school communities have their own expectations and their own needs, the matrices seek to show common concerns in energy education. *The Framework for Energy Education* aims at infusing the concepts of energy education in the Kindergarten through Grade 12 curricula while enlisting all students and educators in the energy management team.

The matrices on pages 6, 8, 10, and 12 are examples of how the goals for energy education can be expanded to include objectives for classroom activities. The matrices are not comprehensive lists of the knowledge, applications, or values applicable to energy education. The teacher may use the matrices as guides in developing his or her instructional program.

The Energy Education Curriculum Planning Activities on page 7, 9, 11, and 13 illustrate how individual instructional cells of the matrices are applicable to a number of subjects. Teachers are urged to reflect on their instructional sequences and focus appropriate segments on energy education goals.

GRADES K-3 MATRIX
OBJECTIVES FOR ENERGY EDUCATION

	Consumer	Individual Well-Being	Career	Recreational	Socio-Legal
Knowledge	The student will become aware that energy can be changed from one form to another.	The student will be aware of interdependence of energy use and personal comfort.	The student will be cognizant of energy uses in parents' jobs.	The student will be aware that the games we play use energy.	The student will become aware that our homes benefit from energy-efficient decisions.
Application	The student will be able to dramatize simple energy changes.	The student will recognize conditions which might affect heating and cooling devices.	The student will be aware that the nature of jobs changes with the source of energy used.	The student will be able to compare the relationship between physical motion and body heat.	The student will be aware of classroom rules that regulate classroom uses of energy.
Values	The student will determine ways to conserve energy at a personal level.	The student will realize one form of energy conservation is as simple as personal selection of clothing for each weather situation.	The student will determine how job choices affect the amount of energy use and how the community is affected.	The student will realize that there can be personal satisfaction in independent play without expending excessive energy.	The student will tolerate some degree of discomfort or loss of independence for the benefit of all.

→ SEE ENERGY EDUCATION ACTIVITIES EXAMPLE PAGE 7.

GRADES K-3 ENERGY EDUCATION ACTIVITIES

CAREER APPLICATION

THE STUDENT WILL BE AWARE THAT THE NATURE OF JOBS CHANGES WITH THE SOURCE OF ENERGY USED. The following activities illustrate how one instructional cell of the matrix is applicable to several subjects. This is not an exhaustive list of possible appropriate activities. The teacher should adapt these or other instructional activities to meet the particular needs of his or her students.

SUBJECT	CORRELATING ACTIVITIES
Language Arts and Social Studies	Students make a list of workers involved in building a house and indicate the use of energy in each of their jobs.
Science	Students interview workers who use alternative sources of energy in construction and ask how they increase home energy efficiency by using these different sources of energy.
Mathematics	Students compute the number of days different workers spend in building houses using energy-saving methods.
Art	Students make a mural showing the workers at various stages of building a house.
Music	Students make musical instruments from discarded building materials to develop an awareness of different sources of energy conservation.
Health	Students develop a simple dance in which they imitate the workers.
Reading	Students read stories related to construction with attention focused on the use of energy in the jobs of the workers.

GRADES 4-6 MATRIX
OBJECTIVES FOR ENERGY EDUCATION

	Consumer	Individual Well-Being	Career	Recreational	Socio-Legal
Knowledge	The student will be aware that consumer decisions are usually directed by one's particular environment or culture.	The student will be aware that the sufficient supply of energy depends essentially on lifestyles and the wise use of natural resources.	The student will be aware that the field of energy offers major career opportunities and satisfying work experiences.	The student will be aware that the supply of world energy affects the way we use leisure time.	The student will be aware that the supply and use of energy are directly related to the world's economic and political well-being.
Application	The student will identify the usability span of different types of beverage containers and will recognize the role of energy in recycling.	The student will be aware of wasteful uses of energy at home and at school and will determine measures which increase the sufficient supply of energy.	The student will identify energy related jobs in society today.	The student will evaluate favorite recreational activities and determine the type of energy used.	The student will recognize that supply and use of energy have an impact on the community, state, nation, and world.
Values	The student will recognize cultural differences in energy use patterns.	The student will recognize how the use of energy affects individual well-being and the fate of generations to come.	The student will be aware of alternative energy resources that could be used to maintain the current lifestyle.	The student will understand how decisions, lifestyle, and leisure time affect energy efficiency.	The student will compare energy uses that are important only for personal comfort or convenience in the home and community.

SEE ENERGY EDUCATION ACTIVITIES EXAMPLE PAGE 9.

GRADES 4-6 ENERGY EDUCATION ACTIVITIES

INDIVIDUAL WELL-BEING AND KNOWLEDGE

THE STUDENT WILL BE AWARE THAT THE SUFFICIENT SUPPLY OF ENERGY IN THE UNITED STATES DEPENDS ESSENTIALLY ON LIFESTYLES AND THE WISE USE OF NATURAL RESOURCES. The following activities illustrate how one instructional cell of the Energy Concerns Matrix is applicable to several subjects. This is not an exhaustive list of possible appropriate activities. The teacher should adapt these or other instructional experiences to meet the particular needs of his or her students.

SUBJECT	CORRELATING ACTIVITIES
Language Arts	The class will compile a newspaper about energy sources and conservation. Include headlines, news stories, feature stories, editorials, letters to the editor, cartoons, and advertisements on energy sources and on how energy could be conserved. The writing of the editorials could be used as a class contest or expanded into a school-wide contest.
Spelling	Introduce the spelling of energy related words. Students participate in class or school "spelling bees."
Reading	Students write a simple poem about the wise use of energy or about alternative energy sources. Poems are read aloud to the reading group.
Mathematics	Students prepare a chart of temperatures in the classroom/school. Chart shows the monthly fuel cost.
Science	Students keep records of their use of electricity for one day, noting the purpose of each energy use and the ways energy could be conserved.
Social Studies	Students list items available for use in the home which are considered luxury items, convenience items, and necessity items and do a comparative study of costs in terms of energy usage.
Art	Students design logos and slogans that will inform people about the need to conserve energy. Students paint a mural using these logos and slogans. After securing permission from local merchants, students reproduce the mural on a store window to further public awareness of need for energy conservation.
Music	Students make a class collection of songs related to energy and learn to sing the songs. Using some of the songs they have learned, students write and produce a play to be presented for the student body.
Health	Students compare health problems of the United States to those of countries that have less energy available and determine the role of energy in providing good health care.

GRADES 6-8 MATRIX
OBJECTIVES FOR ENERGY EDUCATION

	Consumer	Individual Well-Being	Career	Recreational	Socio-Legal
Knowledge	The student will be aware that energy is transformed with a loss of energy during each transformation.	The student will be aware of interdependence of energy use and personal comfort.	The student will be aware of various career opportunities involved in the transformation of energy from source to usable product.	The student will be aware of interdependency of energy use and personal comfort. →	The student will be aware that transformation of energy from source to usable product presents environmental and economic issues.
Application	The student will be cognizant of the forms of energy used to produce basic food groups.	The student will understand that temperatures vary over different surfaces, such as earth, plants, or fabrics.	The student will be aware of careers associated with energy transformation.	The student will relate favorite recreation activities to energy requirements of each.	The student will be able to identify uses of land and compare job opportunities and economic importance of each use.
Values	The student will understand the nutrition and energy economics of food groups.	The student will be aware of advantages and disadvantages of adjusting lifestyles to maximum energy efficiency.	The student will understand that career choices are affected by availability of energy or by alternative sources of energy.	The student will recognize personal satisfaction associated with favorite recreational activities in terms of energy cost.	The student will be aware of advantages and disadvantages of different land uses and of how the use of land affects choices people have.

→ SEE ENERGY EDUCATION ACTIVITIES EXAMPLE PAGE 11.

GRADES 6-8 ENERGY EDUCATION ACTIVITIES

SOCIO-LEGAL AND KNOWLEDGE

THE STUDENT IS AWARE THAT TRANSFORMATION OF ENERGY FROM SOURCE TO USABLE PRODUCT PRESENTS ENVIRONMENTAL AND ECONOMIC ISSUES. The following activities illustrate how one instructional cell of the Energy Concerns Matrix is applicable to several subjects. This is not an exhaustive list of possible appropriate activities. The teacher should adapt these or other instructional experiences to meet the particular needs of his or her students.

SUBJECT	CORRELATING ACTIVITIES
Language Arts	Students interview senior citizens and compare to the present the lifestyles and economic and environmental problems of earlier days when energy use was not as limited. Students interview senior citizens to determine what alternative energy sources were used before present-day energy sources were available.
Social Studies	Students investigate the environmental and economic impact on the community of the use of various types of energy.
Science	Students design an experiment to change energy from one form to another.
Health	Students compare types of current health problems of the community with health problems of earlier days when energy use was a fraction of present use.
Mathematics	Students plot the economic value of energy produced and the cost of dealing with environmental problems incurred.
Art	Students make a diorama of events in earth history that have caused resources to be concentrated in certain locations.
Music	Students experiment with amounts of electrical energy required to produce sounds in various instruments and in amplifier systems.

GRADES 9-12 MATRIX
OBJECTIVES FOR ENERGY EDUCATION

	Consumer	Individual Well-Being	Career	Recreational	Socio-Legal
Knowledge	The student will understand that energy conservation and alternative energy sources will affect consumer behavior.	The student will be aware of the interdependence of personal well-being and comfort and energy consumption.	The student will understand that changing patterns of energy use and alternative sources of energy affect career opportunities now and in the future.	The student will be aware of how the availability of energy and efforts to conserve will affect recreation and lifestyle.	The student will understand that improved energy conservation practices and alternative sources will cause major changes in individual lifestyle and world society.
Application	The student will describe an energy-efficient home, car, school, and appliance.	The student will provide examples of how group and individual well-being are improved by energy conservation in areas of transportation, housing, and recreation.	The student will identify major changes which energy conservation practices or which alternative sources of energy will have on job opportunities in the major occupational clusters.	The student will list and compare energy efficient vs. inefficient recreational activities in the areas of travel, sports, hobbies, and home care.	The student will list major changes in law or social customs which have taken place in the areas of transportation, housing, and recreation as a result of energy shortage.
Values	The student will list the specific advantages and disadvantages of acquiring an energy-efficient home, car, or appliance.	The student will be able to understand the effects of energy-efficient decisions related to transportation, housing, and recreation on personal comfort and well-being.	The student will list the changes which have occurred in his or her parents' careers as a result of changing energy availability or sources and how this has affected their priorities in life.	The student will identify changes which have occurred and project future changes in his or her recreation lifestyle as a result of the current energy situation.	The student will be able to compare the present and projected laws and customs in the areas of transportation, housing, and recreation as a result of energy conservation practices.

→SEE ENERGY EDUCATION ACTIVITIES EXAMPLE PAGE 13.

GRADES 9-12 ENERGY EDUCATION ACTIVITIES

INDIVIDUAL WELL-BEING AND APPLICATION

THE STUDENT WILL PROVIDE EXAMPLES OF HOW GROUP AND INDIVIDUAL WELL-BEING ARE IMPROVED BY ENERGY CONSERVATION IN AREAS OF TRANSPORTATION, HOUSING, AND RECREATION. The following activities illustrate how one instructional cell of the Energy Concerns Matrix is applicable to several subjects. This is not an exhaustive list of possible appropriate activities. The teacher should adapt these or other instructional experiences to meet the particular needs of his or her students.

SUBJECT	CORRELATING ACTIVITIES
Language Arts and Language Learning	Students debate voluntary changes vs. governmental control as a necessity to make changes in energy consumption.
Social Studies	Students interview people who rode trains 30 years ago and people who have ridden trains recently and compare their experiences. Students debate the merits of mass transportation as an energy-saving method.
Science	Students place glass microscope slides covered with petroleum jelly in the exhaust of three different vehicles and compare the amounts of particulate matter expelled.
Health	Students predict the air pollution effect if no students drove cars to or from school.
Mathematics	Students design a scale to rate well-being of individuals riding in a vehicle and graph comparisons of different size cars.
Art	Students express one person's feelings about the need for energy conservation in areas of transportation, housing, and recreation.
Music	Students develop a rhythmic choral reading to compare the sound levels of different kinds of transportation.

COMPLIANCE STATEMENT

TITLE VI, CIVIL RIGHTS ACT OF 1964; THE MODIFIED COURT ORDER, CIVIL ACTION 5281, FEDERAL DISTRICT COURT, EASTERN DISTRICT OF TEXAS, TYLER DIVISION

Reviews of local education agencies pertaining to compliance with Title VI Civil Rights Act of 1964 and with specific requirements of the Modified Court Order, Civil Action No. 5281, Federal District Court, Eastern District of Texas, Tyler Division are conducted periodically by staff representatives of the Texas Education Agency. These reviews cover at least the following policies and practices:

(1) acceptance policies on student transfers from other school districts;

(2) operation of school bus routes or runs on a non-segregated basis;

(3) non-discrimination in extracurricular activities and the use of school facilities;

(4) non-discriminatory practices in the hiring, assigning, promoting, paying, demoting, reassigning, or dismissing of faculty and staff members who work with children;

(5) enrollment and assignment of students without discrimination on the basis of race, color, or national origin;

(6) non-discriminatory practices relating to the use of a student's first language; and

(7) evidence of published procedures for hearing complaints and grievances.

In addition to conducting reviews, the Texas Education Agency staff representatives check complaints of discrimination made by a citizen or citizens residing in a school district where it is alleged discriminatory practices have occurred or are occurring.

Where a violation of Title VI of the Civil Rights Act is found, the findings are reported to the Office for Civil Rights, Department of Health, Education and Welfare.

If there is a direct violation of the Court Order in Civil Action No. 5281 that cannot be cleared through negotiation, the sanctions required by the Court Order are applied.

SECTION 504, REHABILITATION ACT OF 1973; EDUCATION OF THE HANDICAPPED ACT (P.L. 94-142)

No qualified handicapped person will, on the basis of handicap, be excluded from participation in, be denied the benefits of, or otherwise be subject to discrimination under any program or activity operated by the Texas Education Agency. The Texas Education Agency makes positive efforts to employ and advance in employment qualified handicapped individuals.

TITLE IX, CIVIL RIGHTS ACT OF 1964

No person shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity operated by the Texas Education Agency.

TEXAS ENERGY TOPICS

Texas Energy Extension Service

Solar Water Heating — Is It For You?

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Determining the Economics in Texas

Heating water with the sun's energy is one of the oldest uses of solar energy. Today, there are several types of systems available that can be used to heat water for home use.

In order to determine whether solar water heating is right for your purposes, you should consider the following questions:

1. How can I use solar energy for heating water?
2. When is the use of solar feasible?
3. What kinds of systems are available?

Uses of Hot Water Systems

Solar water heating has been used in some states for over 30 years. The relatively low temperatures generated by flat-plate solar collectors are well suited to most domestic water needs, supplying water in the range of 165°F on a hot summer day to 115°F on a cold winter day. Back-up systems are needed to provide for extended periods of cloudiness. A back-up system is simply the conventional water heater that traditionally comes with a house. Although the flat-plate collector is somewhat effective even in cloudy weather, it usually can only pre-heat water for the conventional heater under cloudy conditions.

Solar water heating systems also can be used for swimming pools. One advantage is that the pool acts as its own storage tank. A disadvantage is that the square footage of collectors needed to adequately raise the water to the desired temperature may be large since the collector needs to be one-half to two-thirds as large as the pool surface area. Also, a significant fraction of the heat gained in the collectors will be lost from the pool surface if a pool cover of some type is not used. The cover has inherent problems of its own such as bulk and weight.

Should I Buy A Solar System?

The feasibility of solar water heating systems hinges on several factors, with the primary one being cost. Of course, cost for solar means cost relative to other forms of energy. Up to 17 percent of a family's energy consumption is for heating water. In dollars and cents this means that, with traditional systems, if you heat water with natural gas at a price of 17¢ per day (an average cost for 100 cubic feet of gas which typically heats 100 gallons of water per day), then your bill for hot water is about $5.17 per month. If you heat water with electricity, at a price of 4¢ per kilowatt-hour (kwh), then the bill is about $20 per month to heat 100 gallons of water per day. These figures are based on the average monthly demand of a family of four.

One of the attractions of a solar water heating system is the prospect of "free" energy. However, solar is not free. The initial costs are much higher than a conventional water heating system alone, with average 1978 costs for an installed solar water heating system running about $1200-$2000. Annual maintenance costs for the system will probably average 2-5 percent of the initial system cost, figured at an inflation rate of 6 percent a year.

According to a 1976 study by the Energy Research and Development Administration (now a part of the U.S. Department of Energy), "solar water heating installed at an equipment cost of $20 per square foot of collector is competitive today against electric resistance systems throughout most of the U.S."[1] The study analyzes solar water heating in comparison with other fuel types and concludes that if the cost should be reduced to $10 per square foot, through both technical innovations and incentives, then these solar systems would be economically competitive against all residential fuel types in all but the most adverse conditions.

Another way to figure the economic benefits of solar is to look at the cost of a system and compare it with a conventional system. Using an electric water heater, the cost will run 4¢/kwh = $20/month. Installing a solar system that will serve a family of four with 80 percent of its hot water needs, the following figures can be obtained:

Solar system installed — $1400
80% solar @ 30 yr. mortgage = $12/month
20% electric water heater = $ 4/month
Total bill for hot water = $16/month

Thus, when the alternative is electric water heating, it is possible to save $4/month with a solar system with an electric water heater as back-up. At this point, solar water heating becomes economically feasible. As electricity rates rise, even greater savings may be realized.

What About Systems

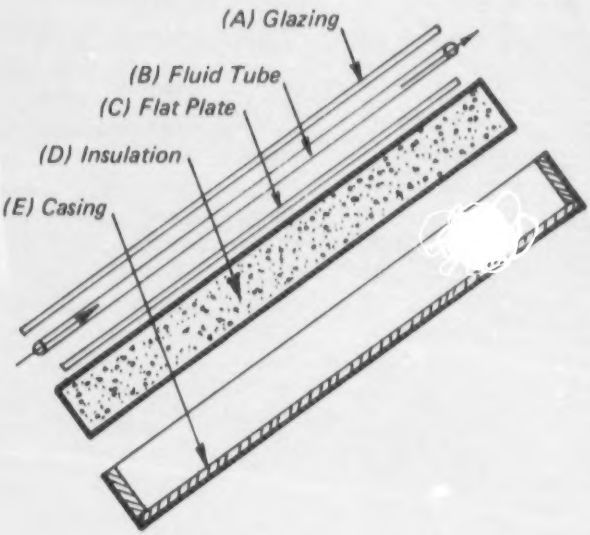
All solar heating systems operate much the same way. The basic parts of the system are the collector, storage, distribution, controls, and auxiliary energy source. The flat-plate collector is the most widely used type for low-temperature water heating. Most collectors use liquid as the heat transfer medium; however, some systems use air for water heating. The collector consists of the following components: glazing (A), usually double-strength glass installed with gaskets or caulking to allow expansion and contraction due to temperature changes; water tubes (B) that are attached above, below or integral to the absorber plate for heat transfer; the absorber plate (C) which usually is metal and is treated with a black paint or dark "selective" coating to improve the plate's ability to absorb heat. The selective finishes are special coatings which absorb most of the sun's rays, thus increasing the efficiency of the collector. However, these finishes cost more than flat black paint. Insulation (D) is used to reduce heat loss through the back of the collector. The insulation must be able to withstand high temperatures that occur when the collector is operating. The enclosure (E) is a container for the components listed above. Together with the glazing, the enclosure makes the collector weathertight.

Kinds of Systems

Two basic kinds of systems exist today for most solar water heating: the open system and the closed system.

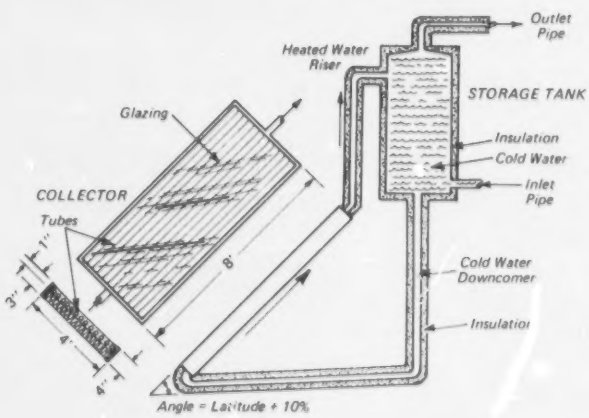
An open system essentially heats water via the collector and circulates it through a storage tank. This water is used for domestic water consumption just as water from a conventional water heater is used. A solar swimming pool heater is an open system, too.

EXPLODED CROSS-SECTION THROUGH A TYPICAL FLAT PLATE SOLAR COLLECTOR



Open systems can be either thermosyphon or forced water. The thermosyphon system is the simplest solar water heating system. It combines a flat-plate collector with a storage tank mounted above the collector. The tank is placed high enough for cold water in the downcomer tube to displace by convection the hot water in the collector, thus causing a slow circulation of water. According to John Yellott, a mechanical engineer and professor of architecture at Arizona State University and long-time

TYPICAL THERMOSYPHON SOLAR WATER COLLECTOR

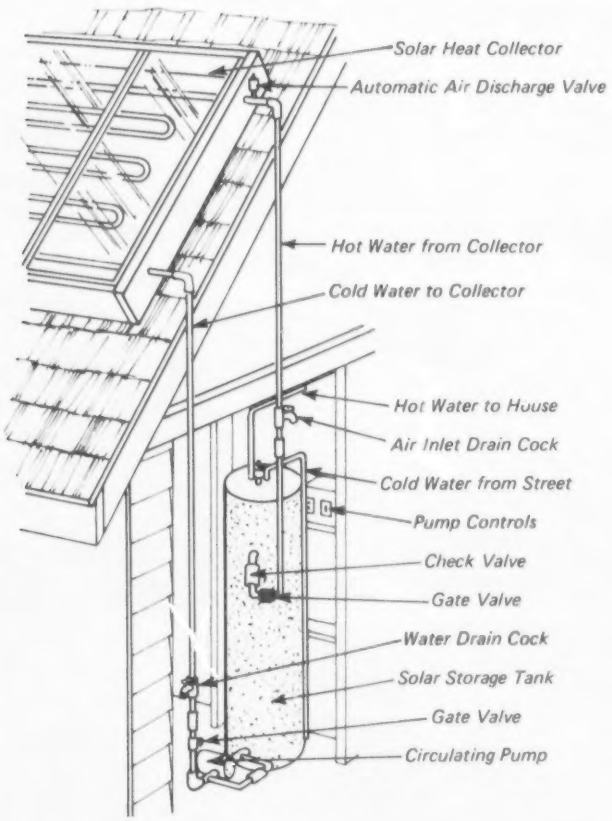


solar advocate, in a good sunny location, free from shade, a 4×8-foot collector can heat 40-50 gallons of water a day. The piping and storage tank should be well insulated to avoid heat loss.[2]

A forced water system contains the same components as the thermosyphon system with the addition of a pump to force the hot water from the collector to the storage tank. The advantage of this system is that the tank can be located any convenient place, not just above the collector. Controls must also be added to ensure that the water returning to the tank is warmer than the water leaving it.

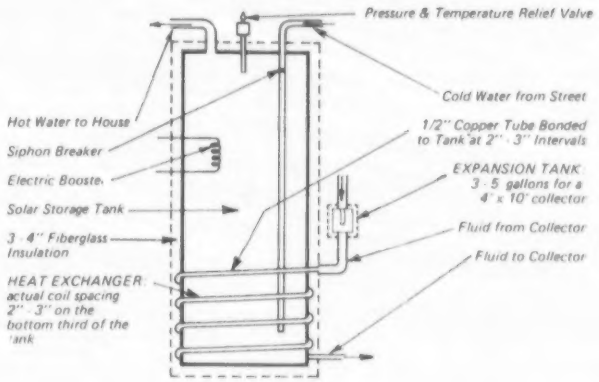
Both kinds of open systems require a drain-down feature that allows all water to drain out of the collectors in order to prevent freeze damage. In some Texas locations that have mild winters, such as Houston, the danger of freezing may be alleviated in a forced water system by continuing to pump the warm stored water through the collector. Of course, this results in additional heat loss through the collector and requires the use of the back-up heating system.

ROOF MOUNTED PUMPED SOLAR WATER HEATING SYSTEM



A closed system includes a heat exchanger and a treated water solution (antifreeze mixed with water) in a closed loop. The treated solution circulates through the collector where it is heated. This solution in turn transfers heat to the home water supply through the heat exchanger. Heat exchangers should be external to the storage tank in order to ensure a double wall between the potentially toxic treated solution and the potable water supply. A closed system can also be thermosyphon or forced water.

SOLAR STORAGE TANK WITH HEAT EXCHANGER


Pressure & Temperature Relief Valve
Cold Water from Street
Hot Water to House
1/2" Copper Tube Bonded to Tank at 2" - 3" Intervals
Siphon Breaker
EXPANSION TANK 3 - 5 gallons for a 4' x 10' collector
Electric Booster
Solar Storage Tank
Fluid from Collector
3 - 4" Fiberglass Insulation
Fluid to Collector
HEAT EXCHANGER actual coil spacing 2" - 3" on the bottom third of the tank

The Final Decision

After reviewing the kinds of solar water heating equipment available, the anticipated life-cycle cost of the systems compared to your fuel costs, and the intended use for the system, consult with a designer, installer or engineer who has solar experience. Also, the most economical installation is with new structures. The National Solar Heating and Cooling Information Center suggests the following when buying solar:

1. Ask for proof that the product will perform as advertised. An independent laboratory or university report should be consulted.
2. Examine the warranty carefully. According to law, the manufacturer must state whether the warranty is full or limited. Ask the seller what financial arrangements, such as an escrow account, have been made to honor the warranties.
3. Solar components should work well together. If the system you are buying is not sold as a single package by one manufacturer, be sure that the seller has experience in choosing compatible components.

4. Be sure you will know specifically who will service the solar system if anything goes wrong. Not just any plumber or handyman will do.
5. Don't try a do-it-yourself kit unless you really have a solid background as a handyman.
6. Check with your local consumer office or Better Business Bureau to determine whether the seller is reputable.
7. If the seller makes verbal claims that are not reflected in the literature handed out, have the claims written down and have the seller sign his name to the statement.
8. If you have what appears to be a legitimate complaint, notify the local district attorney's office, the Better Business Bureau, and the local consumer protection agency. Be specific in your complaint and give as much documentation as possible.[3]

For More Information

You can get additional information about solar water heating, manufacturers, designers or other references by contacting:

The Texas Energy Extension Service
Office of the Director
Texas A&M University
College Station, Texas 77843
Telephone: (713) 845-8025

References

1. *An Economic Analysis of Solar Hot Water and Space Heating,* Energy Research and Development Administration, November 1976.
2. "Solar Radiation and Its Uses on Earth," John I. Yellott, *The Energy Primer,* p. 4, Portola Institute, Fremont, CA, 1974.
3. *Solar Hot Water and Your Home,* National Solar Heating and Cooling Information Center, Rockville, MD.

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